Rock Products

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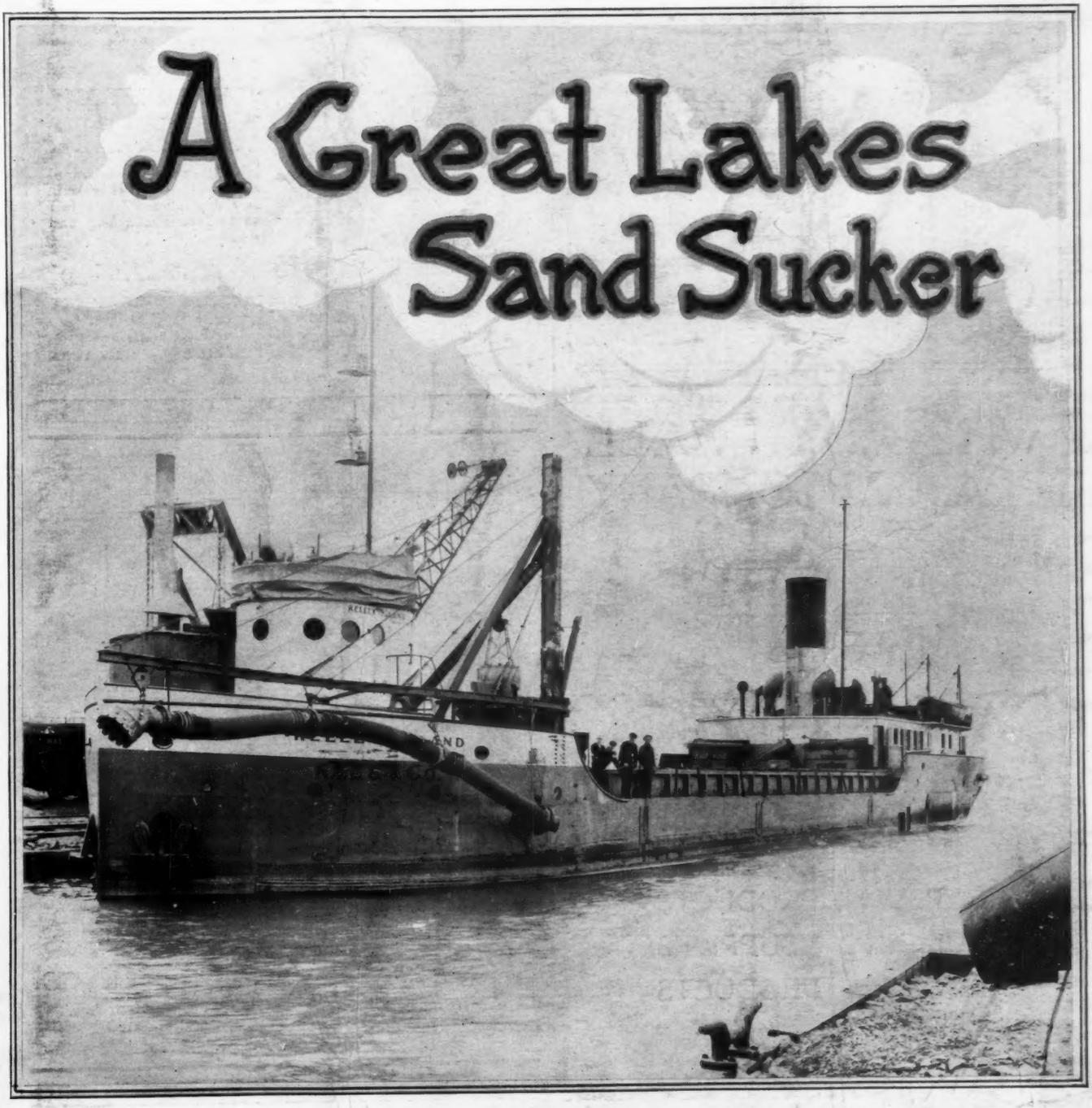
A Great Lakes Sand Sucker



Rock Products

TRADEPRESS PUBLISHING CORPORATION
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Vol. XXI, No. 15 *November* 20, 1918

ALPHABETICAL LIST OF ADVERTISERS

Keep The Truck Wheels Turning!

Pledged to Maintain Victory Transportation

MOTOR trucks are an indispensable factor in the war-making energy of the Nation. An armistice will not stop the countless thousands of them which are hauling war material from factory to camp and shipping wharf. War has multiplied highway transportation. Production must be maintained to meet the extraordinary demands of our Government and its Allies for food, clothing and munitions. These industries depend for their life upon uninterrupted, efficient, expanding, truck service.

Commercial needs have outgrown facilities. There are not enough trucks to go round. Truck makers are still engaged in war production. The White Company's entire output of trucks is required to supply the American and French armies.

Get the Most Out of Every Truck

Though hostilities cease, the truck shortage will remain. This winter it will be acute. It will be difficult if not impossible to get new trucks. Existing installations must be maintained and improved to handle the enormous volume of business.

Truck owners and truck drivers must learn how to get the most out of their equipment, how to avoid unnecessary wear, how to load and unload, route, lubricate and inspect and keep in order, under intensive operation. It is a prime essential to *"Keep the Truck Wheels Turning."*

Operating economy in dollars and cents, desirable as it is, is not the vital need. It is *Truck* economy, the fullest utilization of the transport facilities now available.

Our Transportation Experience Freely Offered

The White Company sees in this emergency an opportunity to be of service to the Nation and to individual truck users. While it has no trucks to offer at present, it has a motor transport experience as broad as American industry. It has not been devoting all these years to just making motor trucks. It has also been building *transportation*, in the sense of a right application of the truck to the haulage task, so that it will perform advantageously, operate continuously, use the least fuel and oil, conserve man power. The company's experience and organization which heretofore has been used to improve the transportation systems of White Truck owners, will now be placed at the disposal of all truck owners, large or small, whether operating White Trucks or equipment of other make.

It is the duty as well as the self interest of every truck user to make the most of

his equipment. The men and women of this country have been saving and giving and working and fighting, to win the war. They have a right to expect that every tool useful in keeping up our industrial efficiency shall be operated at its best. *Motor trucks are important tools.*

Our Pledge to Keep the Truck Wheels Turning

All the resources and the experience of all White Company men in every part of the country, not now engaged in war work, will be devoted to one purpose: to "*Keep the Truck Wheels Turning.*" Every representative is pledged to do all he can to help perpetuate *Victory Transportation.*

The company proposes to distribute in convenient form every helpful hint available for the most effective use of trucks. The first little book, entitled "A War Message to Truck Users," is ready for distribution. It deals with the subject of Supervision, Lubrication and Inspection of large fleets of trucks, by a fleet chief.

Believing that this is no time for a narrow commercialism, The White Company offers its transportation advice to every truck user, of whatever make of truck, free of charge.

Pledge to Maintain Victory Transportation

Every representative of The White Company is pledged to help maintain the transportation of the Nation's industries by offering truck users, of any make, every suggestion that will enable them to keep their trucks in continuous economical and efficient operation, thereby releasing man power, conserving material and fuel and generally helping industry to "carry on."

THE WHITE COMPANY
CLEVELAND, OHIO

A War Message
to
Truck Users

Ask your nearest White Representative for a copy of this booklet or write for it NOW. It may contain suggestions vital to keeping YOUR motor truck wheels turning and perpetuating VICTORY TRANSPORTATION.

THE WHITE COMPANY

CLEVELAND, OHIO, U. S. A.

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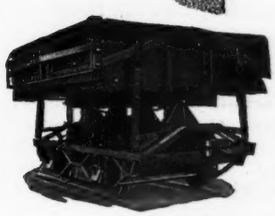

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Cooperation is the thing—please mention ROCK PRODUCTS.

Rock Products

Vol. XXI | Chicago, November 20, 1918 | No. 15

After the Conclusion of Peace—What?

This Country Will See Era of Good Roads Construction Never Before Equaled, Say Highway Experts

AN END of the great world war having come upon us so suddenly, the first feeling is one of mere delirious joy. A great burden has been lifted from the shoulders of mankind and a new era opens, destined to go down in history second only to the era of Christianity. The columns of war news give way to predictions, opinions and thoughts on the future of the world, of democracy, of peoples, nations, of our own nation, and last but not least the immediate future of business.

Certain it is that the demobilization of industry is going to present problems of as pressing importance as its original mobilization and organization. Therefore strong pressure will be brought to bear to preserve for many months at least Government agencies such as the Fuel Administration, the War Industries Board, and other authorities with whom the rock products industries deal. Under the present law the railways will not return to private ownership until 22 months after the conclusion of peace.

The powers exercised by the War Industries Board are to a large extent, if fully legal, based on the war powers of the executive branch of the Government. The President as commander-in-chief of the Army and Navy in time of war has unlimited administrative authority. It is different in times of peace. Moreover, many of the powers exercised by the War Industries Board have been granted it merely by the coöperative spirit of American business interests, which recognized a patriotic duty and gladly made the necessary sacrifices. Now it is different and industry will soon again assert its legal rights and privileges.

During the war all have had a common purpose—to win the war in the shortest possible time. To this end all have agreed that arbitrary central authority was essential. That the same authority is necessary or desirable to readjust business conditions is a matter of honest difference of opinion. The munition manufacturers naturally want the transition to be gradual and would wish many of the restrictions on other industries to continue to that end. The building and construction material industries can hardly be expected to hold that opinion, since they have made the most sacrifices, and can look ahead with certainty to renewed activity just as soon as the readjustment can be made. Any Governmental control which would tend to keep up inflated wages and continue to divert labor from its normal channels is like adding the last straw to the camel's back.

> **I CAN see the making of a new America, a nation of farming communities and small industrial centers; for each will have its own creamery, cannery and other means of taking care of its surplus products. These farming communities will be populated largely by returned veterans, comrades in arms, comrades in peace, the material, political, and spiritual leaders of these communities. These centers must be developed and tied together and made easy of access by good roads, over which the most efficient means of transport will move goods to market.—Secretary of the Interior Lane.**

Taking into account the very discriminatory freight rates which the building material industries may have to continue to carry for many months, certainly all other impediments and restrictions should be made as light as possible and that done as early as possible. And when it is done no industry presents such a rosy-hued future. Building construction may lag for a year or two, but an unparalleled road-building era will probably begin next year.

Cement, quarrymen and sand and gravel men take heart in the following excerpts from letters to the editor from representative State Highway authorities:

ARIZONA—Lamar Cobb, former State Highway Engineer:

"The United States will enter upon a highway construction program the like of which was never dreamed of before. Local communities will think of highway improvement only in terms of millions and the Federal Government in terms of billions. There will be more money expended in highway improvement in ten years after the declaration of peace than in all time preceding that event. The motor truck is just beginning to come into its own and that industry is now only in its swaddling clothes. The portland cement concrete base is the

only one that will be able to stand the traffic that is sure to come."

COLORADO—T. J. Ehrhart, State Highway Commissioner:

"I believe the people of this country are arriving at a full realization of the vital national importance of better roads, and that this crystallization of public opinion will mean congressional action along lines of National Highway building in a large way, supplemented by energetic state coöperation and local support. The pressing need for fields of employment for our returning heroes from France assures highway construction liberal support from every hand. Without a doubt, we shall have a National system of roads which will traverse every state, the importance of which will justify expenditure along the same comprehensive lines that this nation has handled our war needs. Money expended in road building and the reclamation of land will furnish labor employment, and result in permanent assets, adding to the country's production and resources. The expenditure necessary will go into circulation throughout the country, sustaining business, assuring markets, and be of immeasurable value to our trade and social life. There can be no reasonable argument in opposition to this program, therefore I predict an energetic, active road-making campaign immediately following the war."

CONNECTICUT—Charles J. Bennett, State Highway Commissioner:

"It is my opinion that when peace is consummated that this country will enter an era of prosperity surpassing anything previously experienced.

"This, added to the necessary slowing up of highway construction at the present time, will make it necessary for us to speed up the construction of highways so that it will be possible to construct almost twice as much in any given year as we have done heretofore.

"It will also be necessary for us to rebuild many miles of state highway which are at present in service and being worn out by the excessive truck traffic to which they are subjected."

GEORGIA—W. R. Neel, State Highway Engineer:

"It is my opinion that after the war the question of transportation will be paramount and that the Highway will be called upon to solve the problem.

"Of course it will be necessary to hard-surface all of our principal highways to effectively aid in solving this great question. I am recommending the hard-surfacing of a system of 2,000 miles for this State."

ILLINOIS—A. D. Gash, Former President, State Highway Commission:

"A good system of roads ought to be built in the State of Illinois, and we ought to begin it as soon after the war as possible. The proposition for the bond issue for $60,000,000 for building approximately four thousand miles of road, the bonds to be paid out of the automobile fund, has been carried. It will make a primary system of roads in this State which, together with the other natural road building that would come during construction, would give us a system of roads that would be in harmony with the dignity of the State in all other avenues of business and social standing."

INDIANA—L. H. Wright, Chairman, State Highway Commission:

"I feel sure that Indiana will do more road construction and maintenance immediately following the closing of the war than ever has been done before in same length of time. Road construction at this time is almost at a standstill. When the opportunity presents itself it will be necessary to make up for lost time."

MASSACHUSETTS—Wm. D. Sohier, Chairman State Highway Commission:

"There probably will be more road building than there was the year before the war, because so many roads are going to pieces and important work is being put off meantime. Certainly that is true in this State. We shall make any road and every side street that can do the work, do the work, although imperfectly, with the result that resurfacing and reconstruction will be much more needed a year hence than today."

MAINE—Paul D. Sargent, Chief Engineer, State Highway Commission:

"We think we foresee with the return of normal conditions such activity in road building as will eclipse the fondest hopes of the most enthusiastic promoters of road work heretofore. This war is showing the practicability of motor transport as it has never been dreamed of.

"We do not expect to see ordinary business as usual after the war; we do expect to see it better than ever. We believe this statement applies to the business of manufacturing and producing road-building material and equipment as well as to other lines."

MICHIGAN—Frank F. Rogers, State Highway Commissioner:

"In my opinion immediately following the declaration of world peace the largest and most comprehensive road-building program ever seen in this country will be started.

"While I do not look for much new construction in Michigan next year except what is done with strictly local materials within wagon or truck haul of the road, it will be the policy of this department to plan for a large road-building program as soon as the change comes."

MINNESOTA—Chas. M. Bacock, State Highway Commissioner:

"There is every prospect of a very substantial program of road construction following the close of the war. We realize that in the very near future the highways in this State will be subject to an extremely heavy motor-vehicle traffic, particularly on account of the increase in the use of motor trucks, and for that reason are making plans at this time so that at the close of the war we can use the men who are available for substantial construction of the main lines of highways."

MISSISSIPPI—Xavier A. Kramer, State Highway Engineer:

"Now that peace is in sight, there will be more improved roads built in Mississippi during the next five years than ever before in its history. The various counties in the State have on hand now approximately $2,000,000 for road work, and bids will be asked early next year, if favorable conditions prevail."

MONTANA—John N. Eady, Acting Chief Engineer, State Highway Commission:

"We feel justified in expressing the belief that following the war road operations in Montana will be prosecuted with vigor. Quite naturally, local highway officials have adopted a policy of retrenchment, and only essential projects are being carried on at this time. From what we know of the actual requirements of the State, however, it is certain that the next few years will show material progress along the lines of road improvement. No estimate of the probable value of construction operations has been made, although the Commission has planned to take part in working out reconstruction programs for the various county highway departments of Montana."

NEBRASKA—Geo. E. Johnson, State Engineer:

"I have been going over this proposition for some time, and from the information that I have been able to gather, it appears that the only limit that will be placed on highway work, after peace is declared, will be the amount of material that can be furnished. I believe we will have sufficient labor.

"Our State will be more prosperous and have more money in circulation than it has ever had before. People will be in the habit of spending money and paying fair prices for what they receive, and after summing up the entire situation it appears to me that the limit of the amount of work done will be based almost entirely upon the rate at which material can be supplied."

NEVADA—C. C. Cottrell, State Highway Engineer:

"At the present time we have discontinued altogether our construction program, retaining the funds now available for work immediately following the termination of the present war. There will be a very large construction program inaugurated in this state when the war is over and labor is more plentiful. The materials for this work with the exception of a small amount of cement and steel will be obtained locally."

NEW HAMPSHIRE—Frederick E. Everett, State Highway Commissioner:

"The last two years we have had as many applications for road improvement work as we have ever had and while some of the towns have felt that they could not do the work, they are accumulating the money and at the conclusion of peace they will be in condition to build more and better roads than they ever have done.

"I really believe that the next few years will see a great advance in road building of all kinds, as it has been forcibly brought home to us that we need national highways and trancontinental lines, and I believe that the people will demand them."

NEW JERSEY—W. G. Thompson, State Highway Engineer:

"He would be a rash man who would attempt to assert what conditions will obtain in any line of industry for the next two or three years, after the end of the war.

"A few facts, however, are so obvious that they do not need the emphasis that might be laid on them by State highway engineers, viz., that the highways of the country are suffering heavily and must be rebuilt as rapidly as the local finances, conditions, and government restrictions will permit. No one knows what will happen during the next two years, as the country will necessarily be in a very unsettled state, socially and economically, after the end of the war. In the opinion of this office, road-building on a scale larger than ever before attempted will commence just as soon as the government restrictions on the use of road-building materials are lifted and the supply of labor becomes reasonably uniform and constant."

NEW MEXICO—James A. French, State Highway Engineer:

"My belief is that we are on the verge of a tremendous road-building program throughout the United States.

"I believe the Federal appropriation made a couple of years ago of $85,000,000 is only the beginning of a Federal program that will be probably the greatest undertaking ever started in this country."

NORTH CAROLINA—W. S. Fallis, State Highway Engineer:

"As to my impression in regard to such activities, will say that I believe that conditions immediately succeeding a declaration of peace by the warring nations will be that roads of all classes will receive such attention as never heretofore seen in their history, and that especially will the South make rapid strides in the construction of more permanent classes of roads; and bright prospects of unlimited business, it seems to me, is before the producers of road materials of all classes."

NORTH DAKOTA—J. W. Bliss, State Engineer:

"North Dakota has not even in war times shown any marked inclination to suspend highway improvement. This is probably due to the fact that the state is so badly in need of better roads.

"I believe that the farmers will be found willing to be shown the advantages of better roads than they have had heretofore. We have had a number of indications of their enthusiasm. After the war is over I am sure that we will find in North Dakota, and it will be very much the same in all the United States, that the people of the country will demand highway and bridge improvement in magnitude and character such as will eclipse the most optimistic views.

"The writer believes that among some of the other

benefits that will come out of the war there will be a general demand among the people for public improvements on a large scale.

"We have nothing but the rosiest outlook for the future."

OKLAHOMA—Wm. L. Cunningham, State Engineer:

"We are very much encouraged about existing conditions, but it looks to us as if the road business would be the biggest single thing down in the State of Oklahoma after the war, and are making our plans accordingly."

PENNSYLVANIA—J. Denny O'Neil, State Highway Commissioner:

"I have been more or less in touch with road work for many years past and I have never known the people to be so interested and so anxious for good roads as they are at this time, particularly in Pennsylvania. Notwithstanding the abnormal conditions I have succeeded so far in 1918 in placing 71 roads under contract and many of them will be completed during this present year if we can secure the material. I found that the demand for roads was so strong that I induced the local communities to join with the State and pay half the cost of construction. The total cost of the 71 new roads now under construction is four and a half million dollars, in addition to the above we have spent during the present season four and a half million dollars for maintenance.

[Since this letter was written the people of Pennsylvania, at the recent November election, approved a bond issue for $50,000,000 for state highway construction. A similar proposed bond issue had been defeated numerous times in years gone by. This is an excellent index of the tremendous impetus the war has given highway construction in Pennsylvania.—Editor.]

"We have approximately 200 miles of road in Pennsylvania which is used largely by the United States Government in the transportation of army trucks, many of them loaded with munitions and supplies. We have found the trucks are very hard on our improved roads and you can form some idea when I tell you that we have spent already this year in excess of $600,000 in rebuilding many sections of the Lincoln Highway which was made necessary largely because of the thousands of trucks which have gone over this road.

"Last winter we were able to keep the war roads, many of them in mountainous regions, open during the entire winter and are now getting ready with the aid of snow sheds and snow plows to see that all roads used by the Government are kept open during the coming winter."

SOUTH CAROLINA—F. H. Murray, Acting State Highway Engineer:

"I am fully convinced that after the war we will have the greatest boom in highway construction that this country has ever witnessed. There are, for instance, in this State several counties who had succeeded in getting acts through the legislature last year authorizing bond issues of several hundred thousand dollars. These bond issues, of course, have been held up by the Capital Issues Committee, but undoubtedly this work will be taken up as soon as the war is over, and in addition to this there will be carried on the usual yearly building program, which has also been held up by the U. S. Highways Council, who are now allowing the construction only of such roads as may be considered of military importance and the maintenance of roads already constructed. In addition to this, after the war we will have a tremendous boost in the sentiment for good roads from the millions of soldiers who will return from overseas, all of whom will be more or less good roads advocates, since they will have had an opportunity to be eye witnesses of the undisputed fact that the wonderful highways of France have played a tremendous part in the salvation of that country from the Huns."

TENNESSEE—J. J. Murray, Secretary, State Department of Highways:

"In my opinion, after discussing the road program with road officials and leading citizens of this State that immediately following the return of the soldiers now overseas that every effort should be made to conserve the labor that will then become available and use same in the construction of roads in our State. Those who are now seeing service over seas with our armies will return to their native states and localities, realizing the importance of improved roads and of national highways; therefore, I am convinced, after talking in person to many of our soldiers who realize the importance of improved roads as a national necessity that such will be the unanimous opinion of our citizens who have witnessed the importance played in the present war by these systems of improved highways.

"Tennessee will have a substantial sum, approximating $4,500,000, with this amount equaled by the counties, a total of $9,000,000, for road construction during the next three years. Therefore, I consider that during the next three years, road construction will be one of the most necessary and vital necessities for the development of our Nation, and I believe that the Government will give more consideration to co-operation with the counties and states."

VIRGINIA—C. P. Coleman, State Highway Commissioner:

"I am optimist enough to believe that road work immediately after the war will be given a tremendous impetus, certainly in this section of the world.

"We are, of course, badly handicapped at the present time, but there is nothing to prevent our making our plans for future work, and this we are doing in Virginia. I believe that the average highway commissioner is fully alive to the situation, for he realizes that the future welfare and prosperity of this country will depend on cheap transportation, of which highway transportation is the most important link."

WASHINGTON—Hon. Ernest Lester, Governor:

"I would say that in my opinion highway construction will be greatly increased in the State of Washington after the close of the war. Quite an extensive program of road building has been carried on in this State for a number of years. As a result of the war there has been a material lessening in the amount of this class of work done. The consensus of opinion, however, seems to be that when the war shall have ended the program will be again taken up and probably carried forward with even more rapidity in the future than has been the case in the past."

WEST VIRGINIA—A. D. Williams, Engineer-Chairman, State Road Commission:

"In the writer's opinion the advent of peace will bring to this country, an era of prosperity unparalleled in its history, and inasmuch as the present war is awakening not only this nation, but the entire world to the importance of adequate transportation facilities, the business men of the country will put their efforts back of the development of our highway system.

"The days of the horse-drawn vehicle methods will not be serviceable in the future commercial struggles that this nation must enter. Following this war will be a commercial test as gigantic as the military test in which we are now engaged, and the nation that has the best transportation system, will be the most successful and beneficial in that struggle.

"Every person interested in the development of this country should assist in planning an adequate highway system and not only planning a system, but a financial policy, that will insure to this nation adequate transportation facilities and the full development of our resources as a nation by reason of such facilities.

"There can be no other outcome than that of great development."

WISCONSIN—John A. Hazelwood, Chairman, State Highway Commission:

"I always try to be an optimist and look at the bright side of things. I need to exercise strenuous efforts, however, at times to turn the dark clouds inside out, but I am satisfied that after the war we are going to have mighty good times during the reconstruction period. A new democracy will bring to the world new ideals. We will have borrowed more sympathetic view points to look upon our fellowmen after this slaughter fest is over.

"I do not think that people interested in crushed stone, sand and gravel and cement industries, ROCK PRODUCTS, as you call them, will have any reason to complain on account of lack of demands as soon as we are well on our way during our reconstruction period after the close of war.

"The close of the Civil War brought its great problems for solution. The close of this war will present momentous questions for consideration and solution. Following the Civil War there was a great weakness in our transportation facilities. The era of railroad building started and progressed at a remarkable rate in order to meet transportation and distribution needs. I am satisfied that as soon as this war is over our people will see to it that congestion of traffic, due to weakness in our power of transportation and distribution, is remedied.

"Right after the Civil War the thought was centered on building railroads. The thought at the close of this war will be centered on the construction and maintaining of the wagon roads. The great motor-drawn trucks, automobiles and trailers will be built and used by thousands and tens of thousands in every state in the Union immediately at the close of the war. It will be up to us to obtain money by direct taxation and by the issuance of bonds in order to secure funds to properly build the roads, surfacing them in particular, so as to handle this type of transportation.

"ROCK PRODUCTS will be used galore. The market will be great for cement, sand, gravel and stone. The labor market will be well supplied with men anxious and willing to construct highways. The betterment of our roads will follow in every direction as a result of the return of the engineers and other workmen from the trenches across the sea. There will be no shortage of employes, no shortage of materials and no shortage of means to build, without waste, our wagon roads. One thing we must guard against religiously, and that is, to keep fraud, graft and corruption from creeping in during this great reconstruction period. We must not have a similar condemnation following the construction and maintenance of the wagon roads that followed the construction of the railroads through watered stock and profligate waste of capital. There should be returned to the people a dollar's worth of good roads for every dollar expended. Let us go about it carefully, cautiously and deliberately. Let us not be found weak in scientific and systematic direction of this great undertaking. Let us not fail to measure up to the great duties and responsibilities that are placed upon our shoulders. Let us anticipate the situation that will follow and begin at this time to make preparation.

"I think that Woodrow Wilson had a wonderful vision when he recently declared what should be the policy of the Allies after they reach the peace table for deliberation. There are things that should be determined in advance of the real things that are to be done. Wilson was wise in suggesting that fundamental principles should be agreed in advance. We should be determined upon a policy of road construction and maintenance that will eliminate every waste that is sure to follow where lack of intelligent direction and supervision is not applied.

"Illinois has voted the $60,000,000.00 of bond issue for road improvement, but those anticipating to have charge of the expenditure of that vast amount of money should in advance work out carefully such policies for its use as will guarantee proper returns. Wisconsin has gone forward with leaps and bounds in the matter of highway betterment. The Badger State will con-

tinue the good work at an even more rapid speed after the close of the war. There is no reason why road builders should not be very optimistic at this time."

WYOMING—Z. E. Sevison, State Highway Engineer:

"After the war this country will undoubtedly see the greatest progress in highway construction that has ever been known, not only in the way of completing projects which have been postponed, but carrying out and completing a rational system of roads which will serve the requirements of the nation, state and smaller political subdivisions."

Forecast of Coming Congressional Legislation

65TH CONGRESS, 2D SESSION.

H. R. 13128

IN THE HOUSE OF REPRESENTATIVES.

October 31 (calendar day, November 1), 1918.

Mr. Dent (by request) introduced the following bill; which was referred to the Committee on Military Affairs and ordered to be printed:

A Bill

To provide for the taking over, improvement, relocation, construction, and maintenance of a system of national highways and State highways designed to facilitate the movement of troops, equipment, munitions, and supplies, and to promote the general welfare of the people of the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in order to meet the extraordinary wear and damage to the public highways by reason of their use by or on behalf of the Federal Government, and to guarantee that their condition will be such that a continuous service can be made thereof, the Secretary of War is authorized and directed to take over a comprehensive system of roads throughout the United States, designed primarily with a view of facilitating the movement of military troops, equipment, munitions, and supplies, but at the same time, so far as reasonably compatible with said purposes, with a further view to accommodating the Postal Service, facilitating interstate and foreign commerce, aiding agricultural and manufacturing pursuits, and promoting the general welfare of the people of the United States. To these ends the Secretary of War shall confer with the authorities having in charge the construction of highways in the several States, and in such conference shall disclose, so far as reasonably practicable, the outlines of his plans for highways designed for military purposes, to the end that unnecessary duplication of highways be avoided and that highways constructed for other than military purposes may be in a strategic location wherever reasonably possible.

Sec. 2. That said system may be undertaken and completed in such installments or divisions as may seem to the Secretary of War expedient and desirable.

Sec. 3. That the Secretary of War shall forthwith proceed to take over, improve, construct, and maintain such roads of said system of highways as are most necessary to the welfare of the people of the United States.

Sec. 4. That for the purpose of defraying the expenses pertaining to the taking over, improving, constructing, and maintaining of said highway system aforesaid, the sum of $100,000,000, or so much of said sum as may be needed for said purpose, is hereby appropriated out of any funds in the Treasury of the United States not otherwise appropriated.

Sec. 5. That the Secretary of War shall make an annual report to Congress, showing the manner in which the provisions of this Act have been carried out and expenditures made thereunder.

Sec. 6. That out of the appropriation made by or under this Act the Secretary of War is authorized to incur such expense as he may deem necessary for carrying out the provisions of this Act.

Sec. 7. That the Secretary of War is authorized to make rules and regulations for carrying out the provisions of this Act.

Sec. 8. That the term "highways" used in this Act shall include bridges and culverts.

Sec. 9. That this Act shall be in force from the date of its passage.

Future of War Service Committees

MUCH INTEREST is manifest in the future of the War Service Committee on Mineral Aggregates. It future will, of couse, be somewhat dependent on the future of the War Industries Board of which it is necessarily an adjunct. The future of all the war service committees will be the chief topic of discussion at the coming Reconstruction Convention at Atlantic City, noted elsewhere in this issue.

E. Guy Sutton telegraphs that the future of the War Service Committee on Mineral Aggregates will be decided at the next meeting of the committee, which occurs in a short time. Producers need have no fear as to the uses to be made of the assessment fees. The probabilities are that the ending of the war will make possible their use for rehabilitating the industry a much more effective manner than was originally conceived. The same applies to other war service committees.

There is plenty of work yet to be done by a joint committee of crushed-stone and sand and gravel producers, and many operators are in favor of such a committee.

WE DESIRE to co-operate with the American Association of State Highway Officials and the Highway Industries Association in emphasizing the importance of the Highway Convention called jointly by the two Associations for December 11 and 12, Congress Hotel, Chicago, Ill.

Every citizen of the United States who is interested in public welfare, to the extent of protecting the investment already made in highways and to see their future development along definite aggressive and sensible lines should be present and personally participate in the deliberations.

American Automobile Association, Washington, D. C.
Lincoln Highway Association, Detroit, Mich.
National Highways Association, Washington, D. C.
National Old Trails Road Association, Kansas City, Mo.
American Road Builders' Association, New York City.
Pacific Coast Defense League, Seattle, Wash.
Dixie Highway Association, Chattanooga, Tenn.
Jefferson Highway Association, St. Joseph, Mo.
Yellowstone Trail Association, Aberdeen, So. Dak.
Pike's Peak Ocean-to-Ocean Highway, Colorado Springs, Col.
Old Spanish Trail, Tallahassee, Fla.

Sand and Gravel Men Urged to Attend Chicago Road Meeting

ALL indications point to the prospect of an enormous road building program to be carried out within the next five years. There is no construction work that is of greater interest to sand and gravel producers than road building. I hope, therefore, that you will use the pages of ROCK PRODUCTS in making an earnest appeal for the attendance of all sand and gravel producers at the Chicago meeting, Dec. 11 and 12.

It is quite possible that the Executive Committee of the National Association will hold a session in Chicago at that time. While the road convention will probably consume most of the time, yet there is no doubt there will be an opportunity for the sand and gravel men, who are in attendance, to get together and talk over the situation and the future prospects as they appear since peace has been assured.

E. Guy Sutton,
Secretary National Sand and Gravel Producers' Association.
Washington, D. C., Nov. 15, 1918.

Cincinnati Sand and Gravel Men Solve Problem of Practical Co-operation

Local Association with Field Secretary Promotes Harmony Between Producer and Purchaser

MOST business men will readily agree that co-operation is a good thing—in the abstract, but when it comes to the practical application they are from Missouri and in these days when so much is said and written about the need of co-operation it is doubly interesting and instructive to see

Harry Donnelly
President National Association of Sand and Gravel Producers

a little bit of it put into practice. Cincinnati is a place where you can see it done.

Cincinnati, by the way, is the home and bailiwick of Harry Donnelly, president of the National Association of Sand and Gravel Producers, and he was one of the earliest believers in co-operation for sand and gravel men. Mr. Donnelly is now operating three plants, which supply about 50 per cent of the Cincinnati market, so he cannot be accused of promoting association work for self preservation or self protection.

Local Association Early in Field

The local sand and gravel men have an association which antedates most of the other sand and gravel producers' associations. The good accomplished by this little association through mutual acquaintance, good will and good fellowship has furnished the inspiration and argument with which Mr. Donnelly has founded more than one other local association.

This year the Cincinnati association took a big step in advance by appointing one of its members, G. P. Walker, field secretary. Mr. Walker is secretary and treasurer of the Tarco Construction Co., which operates two sand and gravel plants, and is therefore an experienced operator. His work as field secretary of the association is to visit the jobs where sand and gravel are being used, in answer to all complaints or calls for more or different material, and to make such adjustments as may be necessary to give satisfaction.

WITH the return of peace and prosperity, what can your trade association do for you? What service do you expect of it? The columns of "Rock Products" are hereby thrown open to you, one and all, for a free-for-all discussion. When you have finished reading this note sit down and send in your suggestions.—The Editor.

If the material is justly at fault he has authority to have it removed or put to some other use and material which will be satisfactory is substituted. For this other material he can call upon any member of the association and it will be furnished at the contract price made between the original producer and the user.

Again there may be urgent need of material on one contract, while on another the material may be piling up in excess of the actual needs. The field secretary has the authority to divert the material from the job where it is not needed to the one where it is, the producer billing his material direct to the second contractor at the latter's original contract price.

The field secretary is thus the adjustment agent of the whole Cincinnati sand and gravel fraternity. To him any contractor can turn if he is in urgent need of material, or if the material is not suitable to his needs. There is no red tape involved. The producer who furnishes the material used bills the contractor direct and the amount he furnishes is deducted from the original producer's order. The original producer is compensated for the loss of a part of his order by having his customer satisfied and by the law of averages, which in the course of a season gives him equal opportunities to help out some other producer.

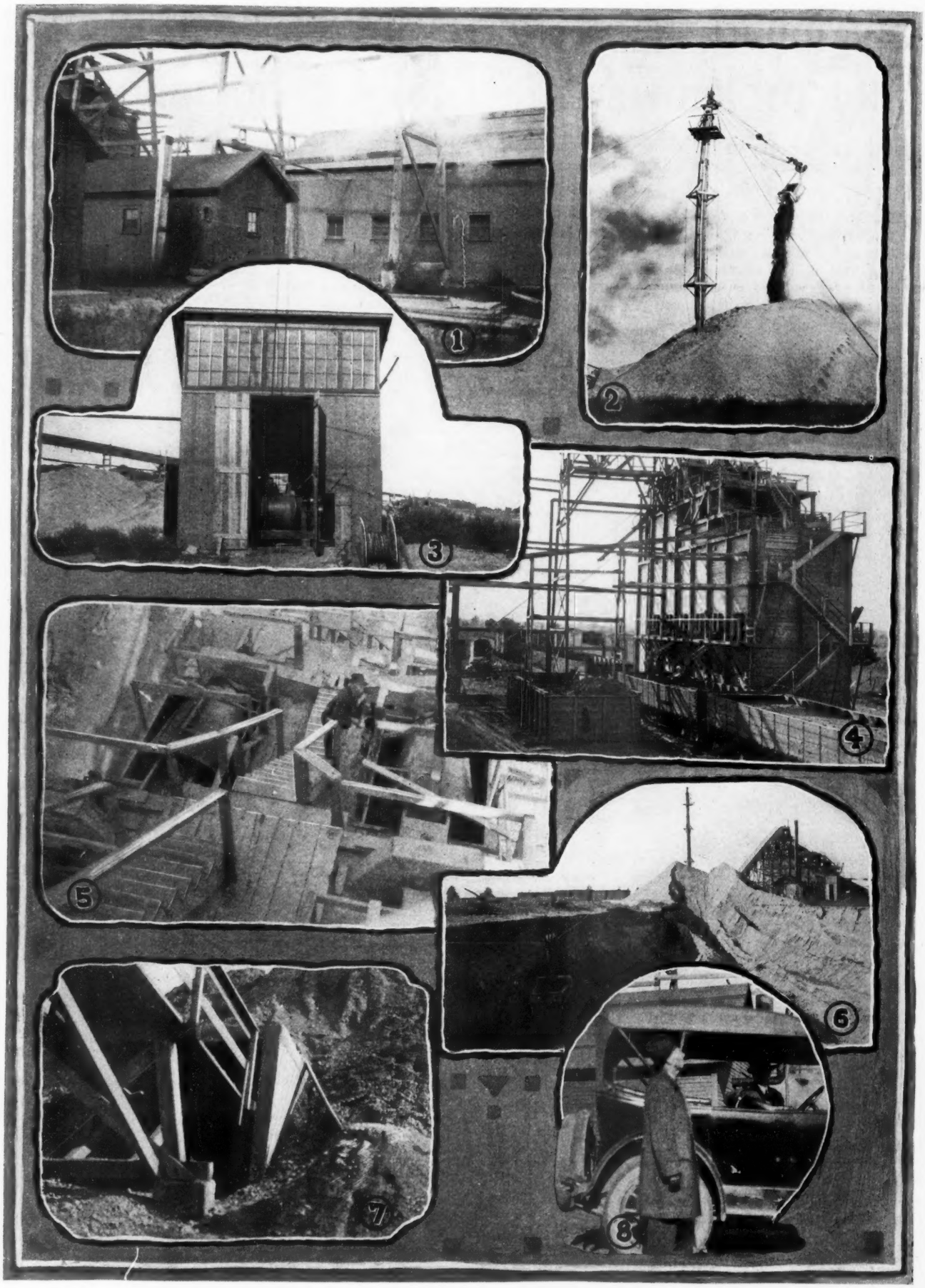
Co-operation Makes Scheme Practicable

Naturally this scheme would not be practicable if there was any great difference

G. P. Walker
Field Secretary Cincinnati Sand and Gravel Association

in the prices the different producers were getting for their material. There is, of course, open competition for all orders and each producer makes his own contract, but the market is not over-produced and cut-throat methods are not in vogue. These were long ago outgrown; and no one objects, least of all the purchaser, who is now assured of good material and good service.

It is here probably that Mr. Donnelly's years of experience as a salesman as well as an operator came to the front, for he knows that there are mighty few business men, be they contractors or engineers, who are not willing to pay a fair price for these two things—quality and service—and if they get these two things they ought to pay a fair price for them. So everybody is satisfied and you have an example of a live, working, practicable co-operative association.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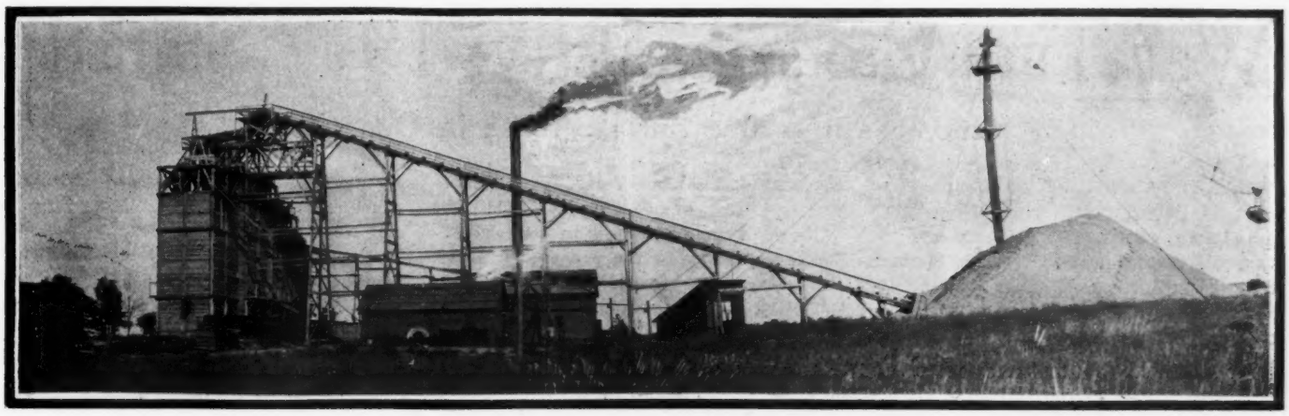


Plant of the Genessee Gravel Co., Near Flint, Michigan

"Good Roads" Earle Has Faith in Future of Michigan Gravel Industry

State's First Highway Commissioner and All-Time Good Roads Apostle, Has Model Plant

WHEN a successful hardware manufacturer—a business man of the shrewd Vermont Yankee type—picks out the sand and gravel business as a field for his sons' business energies, it pretty nearly amounts to an endorsement of the future of the industry. Horatio S. Earle, "the Scythe Man," of Detroit, Mich., says he wants his sons to write their checks with a shovel and not with a gold pen only.

Mr. Earle has had a career that would make an interesting book. From a Vermont farmer's boy, whose father whipped him for whittling little labor-saving inventions out of wood, when he should have been splitting firewood, he has become one of the most prominent hardware manufacturers in the country. His success was achieved only by persistence and industry and is founded on his ability as a salesman and business man as well as that of an inventor and mechanic.

Mr. Earle was the first State Highway Commissioner elected under the Michigan good roads law. He went out along the highways and byways and preached good roads to the farmers when farmers were much more skeptical than they are now. Hence his title of "Good Roads" Earle.

First Season in Sand and Gravel Business

Under the name of the Genessee Gravel Co., Mr. Earle has acquired a property of 340 acres of farm land about 10 miles northeast of Flint, Mich., which is underlaid to an unknown depth with an excellent deposit of sand and gravel. Here he has erected a model drag-line plant having a capacity of about 500 tons per day. To provide rail connection a 2⅛-mile switch had to be built to connect with the Pere Marquette Railway.

Mr. Earle did not have the usual beginner's luck for he has done a good business in spite of the unusual business conditions. He is even making a good profit on his stripping from the only part of his pit that required stripping. About 40 acres is overlaid with several feet of fine sand. He took a sample of this to the city engineer of Flint, hardly expecting it was good for anything. An analysis at the city's laboratory showed it to be the best sample of asphalt sand ever submitted. As a result Mr. Earle is selling all he can scrape up and load for 50 cents a ton, with no washing or other preparation.

On the Opposite Page

1. Power plant; boiler house on right; engine house left.
2. Drag-line mast.
3. Hoist for drag-line.
4. Plant showing one loading track; coal bin for power plant on left of track.
5. Pair of Gilbert screens; note boxing of gears in foreground.
6. Pit with plant in distance.
7. Conveyor tunnel.
8. "Good Roads" Earle and his son.

Model Plant

The plant proper, shown in the accompanying views, is a model of the drag-line type. It has its own steam-power plant—a 150-h. p. horizontal boiler and 125-h. p. horizontal steam engine.

The drag-line is operated from a mast, the bucket dumping on a conical pile over a concrete hopper and conveyor tunnel. The drag-line bucket is operated from a cableway by a hoist operator in a house at one side and about 100 ft. distant from the cableway mast. The scraper bucket is 1½ cu. yd. capacity and the 1¼-in. track cable is about 600 ft. long.

A 24-in. belt conveyor takes the material to the top of the plant where it is delivered to a 42-in. by 12-ft. scalping screen, which removes everything over 1¼ in.

At right angles to the scalping screen is a battery of four 6-ft. Gilbert sizing and washing screens. The sand goes to two automatic settling tanks below the ends of the lower pair of screens.

The screens and conveyor are driven by a four-part 1¼-in. rope drive direct from the engine to a main shaft near the top of the plant. From this main shaft the scalping screen, conveyor and a counter shaft are driven by belts. Chains and sprockets from the countershaft drive the sizing and washing screens. A 6-in. pump main supplies the wash water.

The fine sand carried off by the wash water is partially recovered in storage piles under the waste-water chutes, by 1-in. holes drilled at intervals in the bottom of the chute, or sluice.

The plant was built under the supervision of E. J. Proctor, the superintendent in charge of operation.

War-Time Stone Industry; 1917 Statistics

Increase in Value but Decrease in Quantity

THE TOTAL VALUE of stone sold in the United States in 1917 was $82,215,671, an increase of 4 per cent over the value of that sold in 1916. This increase followed an increase of 6 per cent in 1916 and a decrease of 4 per cent in 1915. The quantity of stone sold in 1917 was approximately 82,800,000 short tons, a decrease of about 9 per cent from that sold in 1916. The increase in value in 1917 was due entirely to the greater value of limestone sold, as the total value of all other varieties of stone sold was less, the decrease ranging from 1 to 11 per cent. An increase of 12 per cent in the value of limestone was due to a large increase in the output of stone quarried for use as furnace flux—from 23,623,508 long tons, valued at $13,946,882, in 1916 to 25,574,146 long tons, valued at $18,679,213, in 1917. The production of limestone sold to industrial works, such as paper mills, sugar factories, glass works, and alkali works, also showed an increase in both quantity and value. The output of limestone for agricultural use, however, decreased 3 per cent in quantity, although it increased 22 per cent in value.

Of all the stone sold monumental stone increased in value of output, and paving stone remained about the same, and an increase in the value of sandstone offset decreases in the values of the other varieties. Building stone, curbing, flagging, riprap, and crushed stone decreased in both quantity and value.

The value of monumental stone in 1917 ($8,102,493) increased 10 per cent over the value in 1916 ($7,372,620). This is the largest value ever reported, but is due to the increase of 38 cents in the average price per cubic foot, as the quantity decreased 10 per cent—from 4,552,039 cubic feet in 1916 to 4,058,626 cubic feet in 1917. In 1917, 83 per cent of the quantity and 70 per cent of the value was for granite, the remainder being for marble.

Continued depression in the building industry in 1917, which affected the better grade of building stone of all kinds, caused a decrease of over 17 per cent in value, and of 30 per cent in quantity. The output for 1917 was 17,263,893 cubic feet, valued at $12,102,914, and that for 1916 was 24,754,742 cubic feet, valued at $14,677,808. The value of paving blocks sold in 1917 was $2,732,444, practically the same as in 1916. This sum represented an output of 48,907,677 blocks having an average value per 1,000 blocks of $55.87. Though figures showing the exact quantity produced in 1916 are not available, a close estimate, based on an exact knowledge of 87 per cent of the output, showed an output of 55,061,840 blocks, a decrease of 11 per cent. The value of both curbing and flagging decreased 13 per cent in 1917, that of stone for riprap decreased 31 per cent, and that of stone for rubble increased nearly 5 per cent. The figures representing sales of stone of these classes are as follows: Curbing, 3,698,275 lineal feet, valued at $1,402,980; flagging, 3,027,115 square feet, valued at $356,327; riprap, 2,682,939 short tons, valued at $2,208,373; rubble, 915,646 short tons, valued at $864,321. Crushed stone amounting to 40,285,377 short tons, valued at $29,065,509, was produced in 1917, a decrease of 7,790,204 tons (16 per cent) in quantity and $397,043 (1.3 per cent) in value. The average value was 72 cents per ton in 1917, an increase of 11 cents.

Industry by States

Pennsylvania, Ohio, Vermont, New York, and Indiana were the ranking states in value of stone produced in 1917 as in 1916. Of the 50 producing states and territories in 1917, two more (Nevada and Mississippi) than in 1916, twenty-six decreased and twenty-four increased the value of their output. In the region east of the Mississippi River 16 states showed increased and 11 states decreased value of output; in the region west of the river 8 states showed increase and 11 states decreased value of output; in the region west of the river 8 states showed increase and 5 decrease.

Wyoming made the greatest percentage of increase (142 per cent) in value in 1917, an increase due to a large output of stone for use in sugar factories. Delaware made an increase of 78 per cent in value, due to stone quarried for use by the United States Government at the Reedy Island breakwater in Delaware River. The percentages of increase made by Michigan, Alabama, Pennsylvania, West Virginia, and New Jersey (37 per cent, 34 per cent, 27 per cent, 22 per cent, and 12 per cent, respectively) were due almost entirely to the increase in the value of furnace flux. In all these states except Pennsylvania an increase was made in both quantity and value.

Other states showing a noteworthy increase in value were Florida (36 per cent), for building stone, crushed stone, and stone for use in agriculture; Kansas (11 per cent) for crushed stone; Maine (17 per cent) for building stone; Nebraska (17 per cent) and South Dakota (11 per cent) for stone for use in sugar factories.

The largest decrease occurred in Wasuington (49 per cent) and was due to lessened production of riprap. The decrease in the other states ranged from 0.1 to 21 per cent and included stone for all purposes.

Quantity and Value of Stone Sold in the United States in 1917

Building stone (cubic feet)	17,263,893	$12,102,914
Monumental stone (cubic feet)	4,058,626	8,102,493
Paving blocks (number)	48,907,677	2,732,434
Curbing (lineal feet)	3,698,275	1,402,980
Flagging (square feet)	3,027,115	356,327
Rubble and Riprap (short tons)	3,598,585	3,072,694
Crushed stone (short tons)	40,285,377	29,065,509
Furnace flux (long tons)	25,574,146	18,679,213
Refractory (short tons)	1,573,573	1,607,743
Manufacturing industries (short tons)	5,446,558	4,070,351
Other uses (short tons)	1,299,887	1,023,013
		$82,215,671

The quantities given above represent approximately 82,800,000 short tons of stone.

Value of Stone Sold in the United States in 1917

Rank of State	State or Territory	Total Value	Percentage of total	Number of plants
1	Pennsylvania	$14,048,158	17.09	459
2	Ohio	6,486,605	7.89	162
3	Vermont	5,920,799	7.20	48
4	New York	5,399,403	6.57	156
5	Indiana	4,449,809	5.41	93
6	Michigan	3,423,825	4.16	35
7	Illinois	3,322,041	4.04	82
8	Massachusetts	3,113,423	3.79	107
9	California	2,911,462	3.54	104
10	Wisconsin	2,787,023	3.39	147
11	Missouri	1,983,300	2.41	137
12	North Carolina	1,896,554	2.31	47
13	New Jersey	1,860,397	2.26	72
14	West Virginia	1,841,071	2.24	51
15	Georgia	1,797,098	2.19	35
16	Minnesota	1,711,318	2.08	66
17	Tennessee	1,635,573	1.99	69
18	Virginia	1,612,118	1.96	68
19	Alabama	1,611,497	1.96	29
20	Maine	1,254,637	1.53	40
21	Connecticut	1,238,684	1.51	46
22	Kentucky	1,118,434	1.36	90
23	Maryland	938,637	1.14	42
24	New Hampshire	921,943	1.12	23
25	Colorado	823,904	1.00	47
26	Texas	697,540	.85	28
27	Kansas	673,831	.82	57
28	Florida	654,845	.80	16
29	Oklahoma	625,048	.76	28
30	Iowa	520,083	.63	45
31	Rhode Island	518,785	.63	16
32	Hawaii	483,453	.59	7
33	Nebraska	476,307	.58	15
34	Washington	454,594	.55	26
35	South Carolina	427,531	.52	15
36	Oregon	413,867	.50	27
37	Arkansas	371,732	.45	15
38	Arizona	319,724	.39	15
39	Utah	305,968	.37	17
40	Montana	255,835	.31	15
41	Delaware	216,346	.26	5
42	South Dakota	182,907	.22	15
43	Wyoming	156,180	.19	9
44	Idaho	94,644	.12	6
45	Alaska	(a)	..	1
46	New Mexico	72,411	.09	5
47	Louisiana	(a)	..	1
48	Nevada	31,625	.04	3
49	Dist. Columbia	4,615	.01	4
50	Mississippi	(a)	..	1
	Undistributed	150,087	.18	
		$82,215,671	100.00	2,647

(a) Included in undistributed.

Value of Stone Sold in 1916 and 1917, by Kinds and Uses

1916	Building (rough and dressed)	Monumental (rough and dressed)	Paving	Curbing	Flagging	Rubble	Riprap	Crushed	Other	Total
Granite	$ 3,964,433	$5,293,210	$2,331,742	$ 828,761	$ 9,395	$254,129	$ 992,788	$ 3,543,416	$ 238,964	$17,456,838
Basalt and related rocks (trap rock)	64,277	.....	57,618	.....	.....	186,491	796,048	6,539,008	22,855	7,666,297
Sandstone	1,316,287	(b)	327,264	702,902	389,859	86,938	488,874	1,664,694	626,960	5,603,778
Limestone	4,588,205	(b)	14,237	79,338	10,411	297,772	1,357,457	17,715,434	17,246,745	41,309,599
Marble	a4,744,606	2,079,410	.....	.....	.....	.....	.....	(b)	209,155	7,033,171
	$14,677,808	$7,372,620	$2,730,861	$1,611,001	$409,665	$825,330	$3,635,167	$29,462,552	$18,344,679	$79,069,683
1917										
Granite	$ 3,161,294	$5,704,776	$2,319,598	$ 699,444	(b)	$199,766	$ 583,409	$ 2,700,620	$ 176,050	$15,544,957
Basalt and related rocks (trap rock)	39,200	.....	52,755	.....	.....	328,561	506,616	6,600,957	42,796	7,570,885
Sandstone	1,043,226	(b)	352,808	651,564	348,000	65,667	263,464	1,400,705	1,386,987	5,512,421
Limestone	4,115,366	(b)	7,273	51,972	8,327	270,327	854,884	17,541,098	23,414,132	46,263,379
Marble	3,702,563	2,397,717	.....	.....	.....	.....	.....	.....	230,107	6,330,387
Miscellaneous	12,041,265	.....	.....	.....	.....	.....	.....	822,129	130,248	993,642
	$12,102,914	$8,102,493	$2,732,434	$1,402,980	$356,327	$864,321	$2,208,373	$29,065,509	$25,380,320	$82,215,671
Percentage of increase or decrease for 1917	—17.5	+9.9	+.06	—12.9	—13.0	+4.7	—30.9	—1.3	+38.4	+4.00

a—Includes stone for both exterior and interior building.
b—Small values included under "other."

Not So Many Producers

The number of plants reporting operations in 1917 was 2,647, which was 388 less than in 1916. A large number of the small quarries were closed on account of scarcity of labor, increased cost of supplies, lack of local demand, and substitution of cheaper material. Many of the larger producers reported that the demand was very good but that shortage of cars and railroad embargoes on shipments curtailed the output. The increase in the cost of operation was 20 to 75 per cent, and the advance in the selling price was 20 to 50 per cent. Many contracts entered into early in the year were made unprofitable by the constantly increasing costs without change in price.

Official Figures

The foregoing statements and the following tables are based on returns received from producers and compiled under the direction of G. F. Loughlin, of the United States Geological Survey, in co-operation with the State Geological Surveys of Alabama, Florida, Illinois, Iowa, Maryland, Michigan, Minnesota, Missouri, New Jersey, New York, North Carolina, Oregon, Pennsylvania, Virginia, Washington and Wisconsin.

Value of the Different Kinds of Stone Produced and Sold in the United States, 1908-1917

Year	Granite	Basalt and related rocks (trap rock)*	Sandstone	Marble	Limestone	Miscellaneous†	Total
1908	$18,420,080	$4,282,406	$7,594,091	$7,733,920	$27,682,002	.....	$65,712,499
1909	19,581,597	5,133,842	8,010,454	6,548,905	32,070,401	.....	71,345,199
1910	20,541,967	6,452,141	7,930,019	6,992,779	34,603,678	.....	76,520,584
1911	21,194,228	6,739,141	7,730,868	7,546,718	33,897,612	.....	77,108,567
1912	19,223,302	7,560,049	6,893,611	7,786,458	36,729,800	.....	78,193,220
1913	20,733,217	9,134,494	7,248,965	7,870,890	38,745,429	.....	83,732,995
1914	20,160,730	7,865,998	7,501,808	8,121,412	33,894,155	.....	77,544,103
1915	17,864,439	8,489,222	6,095,800	6,916,025	35,229,866	.....	74,595,352
1916	17,456,838	7,666,297	5,603,778	7,033,171	41,309,599	.....	79,069,683
1917	15,544,957	7,570,885	5,512,421	6,330,387	46,263,379	$993,642	82,215,671
Percentage of increase or decrease in 1917	—11.0	—1.2	—1.6	—10.0	+12.0	....	+4.0
Percentage of total	18.9	9.2	6.7	7.7	56.3	1.2	100.

* The term "trap rock" has been variously interpreted and in some localities has been made to include a number of widely different rocks; it is here replaced by the title "basalt and related rocks."

† Includes mica schist for furnace lining, conglomerate, argillite, and various light volcanic rocks—for crushed stone, which can not be properly classified in any of the main groups.

Production of Rock Products in Province of Quebec, Official Report

THE Department of Mines of the Province of Quebec in its report for 1917 gives the following table on the production of rock products:

Substances—	No. of workmen	Salaries	Quantities	Value	Value in 1916
Cement, bbls.	530	$536,348	2,079,404	$3,264,664	$2,525,841
Granite	184	92,452	.....	167,659	292,270
Lime, bush	188	101,776	1,500,728	343,588	276,245
Limestone and marble	963	391,980	.....	749,592	978,945
Stand, building	111	51,644	.....	161,840	168,891
Slate, sq.	19	10,933	1,422	7,789	6,223
Sandstone	12	6,398	.....	7,475	8,190
Feldspar, tons	...	.....	1,195	8,225	20,760
Kaolin, tons	27	22,000	833	11,744	17,500
Quartz and silica	41	15,706	10,876	32,511	27,810

Lake Erie Sand Sucker

THE PUMPING from sand and gravel from the bottoms of rivers and lakes has developed into an industry of magnitude. All along our navigable rivers and the Great Lakes are boats which constantly requisition the bottoms of these streams and lakes for their cargoes.

The sand and gravel is sucked up by big pumps through a large suction hose. This hose is usually so large that it has to be made and joined together in sections, usually about ten feet long.

The boat in the front cover picture is the "Kelly Island," one of the sand fleet of the Kelly Island Lime & Transport Co., Detroit, Mich. This boat is fitted with 30 ft. of 15-in. hose in three sections.

"Rubber-Stone"—A New Road Building Material

A New Field for Limestone Screenings Developed by the Dunbar-Stone Co., Detroit, Mich.

WATERBOUND MACADAM has always been more or less a misnomer since it is not the water which binds the pieces of stone together but the rock dust. The name has stuck, however, because it has always been known that water played a very important part in making the dust binder fulfill its function, and because water is always freely used in the construction of a "waterbound" macadam road.

Drying out is fatal to a waterbound macadam road, because the dust which is intended to bind the stone particles is sucked out by automobile tires and blows away. In damp weather a macadam road can be kept in good condition under almost any kind of traffic, if properly drained, but a few weeks of dry weather and dense automobile traffic will soon ruin it.

To prevent macadam roads from drying out, various expedients have been tried, including coating them with oil, tar or asphalt. Many experiments have been made with calcium chloride, a waste product in the manufacture of ordinary table salt and of other chemical processes. But most of these experiments have been made by sprinkling the road surface with a solution.

Calcium chloride will absorb water from the air, so that a pile of it will always be damp. However, it is readily soluble in water and when applied to the surface of a roadway a few rains will wash it away.

The mixing of a solution of calcium chloride and crushed stone and screenings in the same way that tar and asphalt are mixed with stone is the invention of a Detroit man named S. G. Howe. With crushed limestone the results have been very satisfactory. During the past four or five years a number of miles of cemetery and park roads, driveways, etc., in and about Detroit, have been constructed of this mixture, which the inventor calls "rubber-stone" because the roadways seem to retain that springiness and easy-riding quality for which macadam roads are notable.

Plant of the Dunbar-Stone Co. for making "rubber-stone"

During the past year the Dunbar-Stone Co., River Rouge, near Detroit, Mich., has put in a mixing plant (illustrated herewith) and has developed a very considerable trade in "rubber-stone." E. C. Dunbar, General Manager of the Dunbar-Stone Co., has become an enthusiastic promoter of "rubber-stone" although when he first began an investigation of its merits he was as skeptical as probably the average reader is.

There is no question but that the addition of the calcium chloride solution gives to the limestone screenings and dust a power to retain moisture and thus preserve their binding qualities in a "water-bound" macadam road. Here are some of the claims made for the new road material in an interesting booklet published by the S. G. H. Rubber-Stone Co., Detroit:

"In 'rubber-stone' the added chemicals, through a sponge-like action, produce a stabilizer and thus an even degree of dampness is maintained throughout the mass. This chemical combination has great adhesive properties and attaches itself to any fine particles of stone. When so attached it will not wash off, waste or evaporate, but it will gather moisture from the air, dew, rains and from the soil below the roadbed. The roadway is thus constantly damp and well packed.

"The continuously damp packing condition resulting from this same moisture-retaining feature gives a degree of elasticity that prevents the crushing of the surface of the roadway even under the heaviest loads. There is just enough moisture in the road to cause automobile tires to serve as a constructive medium instead of a destructive one. The tires have a tendency to iron-out the road and pack it down rather than suck up the particles or form ruts. The reverse of this is true of roadways with a dry, non-elastic, unyielding surface. It is necessary to maintain a thickness of from four to five inches of 'rubber-stone' in order to hold enough moisture to insure this indispensable condition.

Will Always Knit.

"It matters little how many times 'rubber-stone' is torn up and relaid, as it will always knit together perfectly. If a depression develops, all that is necessary to repair it is to loosen the 'rubber-stone' with a pickax, throw in enough more of the material to fill the depression and tramp it down.

"One man with a horse and wagon or a small motor truck and a stock pile of 'rubber-stone' can keep from 12 to 15 miles of 16 to 20-ft. wide roadway in perfect condition. This cannot be done with any other road-building material that will stand up under exacting present-day traffic.

"'Rubber-stone' can be laid on a foundation 6 to 10 in. deep formed of cinders, crushed slag, coarse gravel or crushed stone. As there is an abundance of these materials in this country, the most durable road possible can be constructed at a very low cost."

Tests of Road-Building Rock

RESULTS OF PHYSICAL TESTS in 1916 and 1917 of road-building rock are given in Bulletin 670, recently issued by the United States Department of Agriculture. This bulletin supersedes the department's Bulletin 537, and supplements Bulletin 370 which gave the results of the more common physical tests of approximately 3,650 road-building rocks examined prior to January 1, 1916. The rock tested came from most of the states. In a number of cases, in addition to other tests, the crushing strength of the rock also is given. The bulletin also contains a complete record of all the crushing strength tests made by the office prior to January 1, 1916.

Labor Saving in Limestone Quarrying—III*

Rock Transportation—Crushing—Safety Measures

By Oliver Bowles

A SIMPLE AND DIRECT SYSTEM of transportation is an important factor in designing a new quarry plant. Ease of transportation depends greatly on the situation of the rock ledge. If close to transportation lines and at a high level, conditions are most favorable. A shelf quarry with its floor at a higher level than the crusher or other plant operated in connection with the quarry represents the most favorable condition, for thus transportation may be accomplished by a single operation. Conditions are usually less favorable than the ideal relation of plant and quarry referred to above, and, in consequence, more complex transportation systems may be required. Whatever the conditions may be, a single efficient system is to be desired, and, if this is not possible, the fewest possible combinations of different systems of transportation should be employed. An instance has been observed where transportation of rock from the quarry face to the crusher involved the use of a horse, a cable incline, and a locomotive. Such a complication of systems involves an excessive amount of labor.

Utilization of Gravity

Gravity, when properly utilized, is an effective substitute for power, and it should therefore be utilized for transportation purposes wherever possible. A previous report† issued by the Bureau of Mines cites the use of the gravity system by a New Jersey quarry, its utilization being so advantageous that, for an average production of 1200 tons of rock per day, transportation within the quarry requires the services of one man only.

At one New York quarry, the rock is hauled to the crusher in cars by locomotives, all subsequent movements being assisted greatly by gravity. The plant is on a hillside, the crusher, screens, storage bin, and railway line for final haulage being at successively lower levels. Accordingly, the movement of the rock is automatic and requires little or no supervision.

The substitution of the force of gravity for man-power offers many attractive possibilities when viewed in the light of present labor shortage.

Transportation Equipment

An adequate supply of rolling stock is essential as regards labor economy. A shortage of cars or of locomotives is sure to result in frequent temporary delays with consequent loss in labor efficiency.

Cars should be strong enough to withstand the hard usage required of them in the process of loading and unloading. Car breakage may tie up transportation, and any prolonged delay may retard operation in other departments, such as loading and crushing. Furthermore, frequent repairs reduce the available car supply and increase the labor requirement in the repair shops. A certain amount of repair work is inevitable but the use of strong cars tends to reduce the necessary repair work.

Certain types of equipment tend to conserve labor. By means of a central-control, three-rail electric system now employed in certain large limestone quarries, several thousand tons of rock may be delivered from the steam shovel to the crusher daily with the employment of only 2 or 3 men. Aerial tramways and various types of cableways are for the most part automatic and thus require little labor.

Trackage

Except where cable cars are employed, heavy grades should be eliminated as far as possible. Car haulage, on heavy grades, is wasteful of time and power. The maintenance of a firm roadbed and uniform gage also tend to permit rapid and safe movement of trains. The trackage system connected with any quarry should be planned to cover the most convenient and direct routes.

In connection with both trackage and rolling stock, it is imperative that all repair work receive immediate and careful attention. It is a false economy of labor to reduce the normal number of repair men; for with defective equipment there is constant danger of accident and delay.

Rehandling of Material

A fruitful source of wasted effort is unnecessary rehandling of material. Rock is commonly unloaded and reloaded unnecessarily, or dumped in places that require excessive labor for its subsequent removal. An instance has been observed where a small percentage of a type of rock necessary for plant operation is brought from a distance and mixed with the main supply of rock quarried at the plant. Such rock is carried in hopper-bottom cars, dumped to the bottom of a 40-ft. quarry pit, reloaded by hand into carts, hauled by mules to the foot of an incline, and lifted by cable to the crusher. Such excessive rehandling may be due to lack of equipment or to faulty plant design. In time of labor shortage, it is imperative that radical changes be made to remedy such faults.

Crushing—Size of Crusher

The size of the crusher employed has a direct bearing on the labor requirement, not only in the actual crushing operation but also in other branches of quarry work. A prolific source of wasted labor is the employment of a small crusher for rock loaded with a powerful steam-shovel. The attempt is commonly made to substitute steam-shovels for hand-loading methods, and, at the same time, to retain the small crushers usually employed for reducing rock loaded by hand. Such a combination of a massive loading apparatus with a small crusher has a two-fold effect on the labor requirement.

In the first place, much labor may be required to force the large rock fragments into the crusher. An instance has been noted where a No. 9 gyratory crusher is employed to handle rock loaded with a No. 60 Marion steam-shovel. Four men were employed to force the rock fragments into the crusher, and the total output averaged only 400 tons per day. Obviously, the rock could be handled with greater facility and with fewer movements by the employment of a crusher having a wide mouth.

A second result of the combination mentioned, indicating that it entails an excessive labor requirement, relates to the process of handling rock in the quarry. Were a large crusher used, blocks of the full capacity of the steam-shovel dipper could be loaded. If, however, the crusher has a narrow opening, all large blocks of stone must be reduced to convenient size. Large blocks must, therefore, be shattered ahead of the steam-shovel or be set aside and subsequently broken up by blasting. It is evident that such processes demand additional labor.

Type of Crusher

Opinion is divided as to the best type of crusher to be employed. Gyratory crushers are popular and are in common use. Single or double roll crushers have the advantage of wide mouths that are not readily obstructed by blocks of stone. A jaw crusher fed by a traveling apron is an effective labor-saver.

Devices for Removal of Jammed Blocks

The jamming of blocks of stone in a crusher mouth, particularly of a gyratory crusher, is a common occurrence. If adequate facilities for the removal of such blocks are not provided, much time and labor may be wasted. The attempt to loosen blocks of stone jammed in a crusher by using a bar or a sledge may so delay the crusher that other related operations, particularly transportation, may be temporarily suspended. It is wise, therefore, to equip rock-crushing plants with mechanical devices to be used in such emergencies. The use of rope tackle or a pneumatic hoist is common, and either renders efficient serv-

† Bowles, Oliver, Work cited, p. 133.

* War Minerals Investigation Series No. 1, U. S. Bureau of Mines, Washington, D. C.

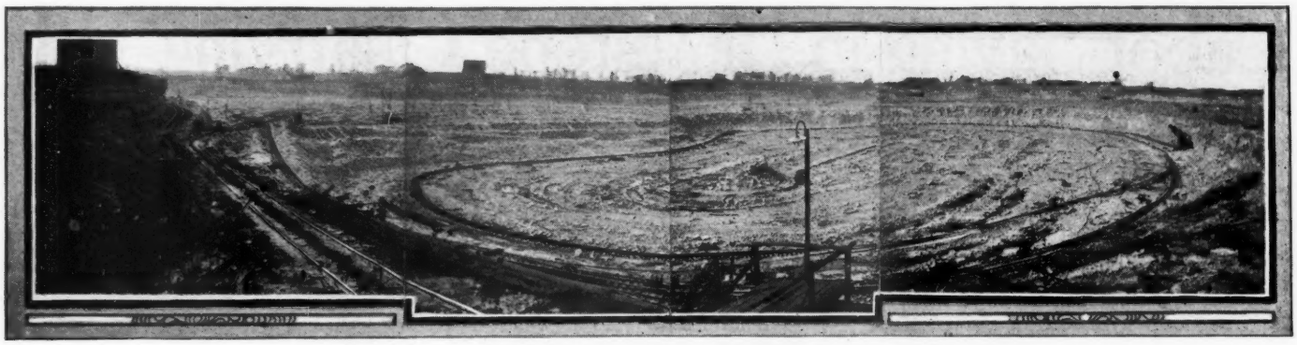


Fig. 1—Panoramic view of quarry of Dolese & Shepard Co. near Chicago, Ill.

A GOOD EXAMPLE of a centrally controlled three-rail electric railway system for quarry stone transportation, referred to by Mr. Bowles, is illustrated herewith. These views were taken recently at the plant of the Dolese & Shepard Co., near Chicago, Ill. This is one of the earliest quarry installations of this type and has proved very satisfactory.

The movements of cars in the quarry are controlled from the tower at the extreme left of the panoramic view. The cars come out of the quarry on a 6 per cent incline as shown in Fig. 2. The track in the foreground is for inbound cars. The track at the left coming around the bluff is for empty outbound cars. This track passes under the inbound track through a tunnel into the quarry.

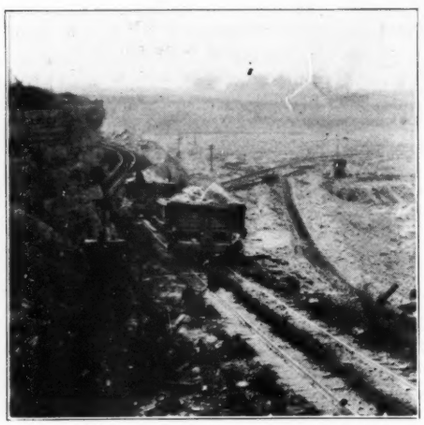


Fig. 2—Loaded cars on incline

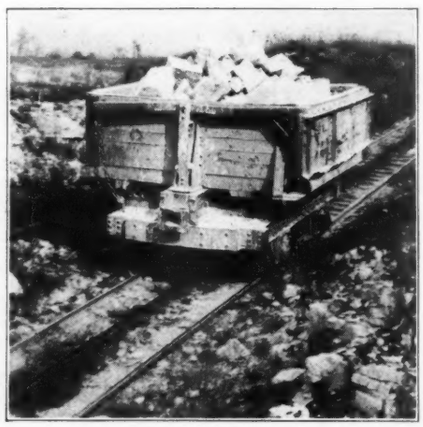


Fig. 3—Centrally-controlled electric quarry car

The cars in the quarry are controlled from the tower shown in Fig. 1 until they reach the top of the incline shown in Fig. 4. Here they come in sight of a control tower at the crushing plant and are operated from this latter tower until they appear on the track rounding the bluff, shown in Fig. 2. This system of haulage is known as the Woodford centrally controlled electric system and is installed by the Woodford Enginering Co., Chicago. A more complete description of a recent installation of this system will appear in a later issue.

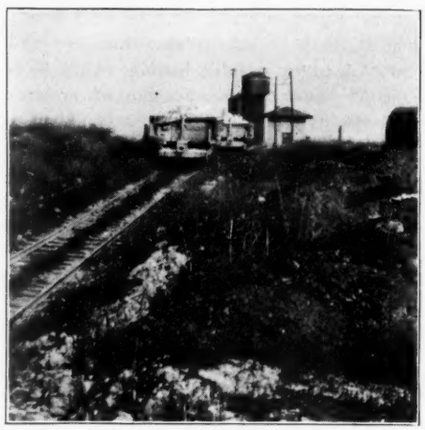


Fig. 4—Cars at top of quarry incline

ice. Where such equipment is available, delays of one-half to three-quarters of an hour that ensued from the employment of old-time methods may be reduced to delays of two to three minutes' duration only.

Safety Measures—Importance of the War-Worker

The fact is emphasized more and more every day that man-power will win the war. Every one whose work contributes to the success of an essential industry should, therefore, consider himself a unit in the war machine. Quarrymen who provide rock necessary for military purposes are helping to win the war, and, if for any cause, such quarrymen cease work, others must take their places or the military program will suffer. When, therefore, through sickness or accident, such workers are incapacitated for service, there is a consequent loss in man-power. The accident or illness may appear to be unavoidable, in which case a remedy may be difficult to find. When, however, sickness or accident occurs through preventable causes, it is urgent that steps be immediately taken to establish safe and sanitary conditions, for any unnecessary wastage of man-power robs the country of service at a time when every individual's effort is most in demand.

Safety in Relation to Labor Shortage

The quarry industries are suffering from a shortage of labor. Action lately taken by the United States Employment Service of the Department of Labor to allocate unskilled labor to essential industries is of great asistance in maintaining an adequate supply. This, however, does not relieve quarrymen of the responsibility of conserving labor to the utmost, for the supply is not equal to the demand. Moreover, such allocation does not apply to skilled labor and, therefore, no provision is made for replacing ill or disabled skilled quarrymen. Thus, every loss of a workman, particularly of a skilled man, renders the labor situation more acute.

The Operator's Responsibility

At all times operators of quarries have before them the plain duty of taking active measures to provide for the safety and health of their employees. At the present time, however, operators of quarries providing products of military necessity have the additional responsibility of conserving man-power at a time when such conservation is of vital importance to the welfare of the nation.

The operator is responsible for the inspection of equipment and for whatever repair is necessary to keep it in safe con-

dition. It is his duty also to establish wise safety rules and to insist upon their rigid enforcement. Provision should be made for proper sanitation, and for all other matters pertaining to the health of employees, and to the proper care of those that may be suffering from illness or acident, in order that they may be speedily restored to active service.

The Employee's Responsibility

Any number of safety measures carefully planned by quarry operators will not free the employee of his share in the responsibility. The employment of dangerous methods, the failure to report observed dangers, and the frequent temptation to "take a chance" are fruitful sources of accident. Every employee should feel that he is a cog in the machine, that his utmost service is demanded, and that his country's welfare depends, in part, on his activity. This feeling should be an incentive for watchfulness to avoid all unnecessary dangers and thus to preserve health and strength for the duties he is called upon to perform.

Suggestions tending to promote the safety and efficiency of quarry operators and employees have been incorporated in various publications issued by the Bureau of Mines and available for free distribution. Every quarryman should obtain a copy of Bureau of Mines Technical Paper 111* and should endeavor to put into practice the rules and suggestions made therein. Other publications of the Bureau dealing with safety problems in quarrying are Bulletin 80, "A primer on explosives for metal mines and quarrymen," by C. E. Munroe and Clarence Hall; Technical Paper 18, "Magazines and thaw houses for explosives," by Clarence Hall and S. P. Howell; Miners' Circular 11, "Accidents from mine cars and locomotives," by L. M. Jones; Miners' Circular 13, "Safety in tunneling," by D. W. Brunton and J. A. Davis; Miners' Circular 17, "Accidents from falls of rock or ore," by Edwin Higgins.

By faulty equipment, by unsanitary surroundings, or by carelessness, the effective personnel of a quarry may be materially reduced through accident or disease. If, on the other hand, the quarry equipment is kept in a safe condition, if healthful surroundings are maintained, and if due watchfulness is exercised in quarry operations, both operators and employees may feel that they are doing their full share in conserving the man power of the nation.

* Bowles, Oliver, Safety in stone quarrying—Bureau of Mines Technical Paper 111, 1915, 48 pp., 5 pl., 4 figs.

Exports of Cement Are Increasing

Cuba and South America Becoming Better Customers

WASHINGTON, D. C.—Exports of cement for the first eight months of 1918 show a decided increase in value over those for the corresponding periods of either of the two preceding years, according to a report just secured from the Department of Commerce.

Total exports for the eight-month period amounted to 1,619,338 bbls., valued at $4,010,134, as compared with 1,606,595 barrels, worth $3,138,541, during that period in 1917, and 1,794,263 bbls., with a value of $2,602,832 in 1916.

Bulk Goes to Cuba

The bulk of our exports of cement are destined for Cuba which, so far this year, has taken 504,383 bbls., valued at $1,249,082. In quantity, this was less than for either 1916 or 1917, although the value is greater than even in 1916, when 618,530 bbls., worth $913,292, were exported. In 1917, the exports amounted to 559,030 bbls., and the value to $1,102,216.

Our new cement market, Argentina, bids fair to become a prominent factor of our export trade, already standing third in volume. During the eight-month period we shipped to that country 177,609 bbls., with a value of $435,665. This is the first year in which Argentina has taken enough cement to warrant the keeping of separate statistics for that country.

Brazil Good Customer

The only country, with the exception of Cuba, taking more than Argentina is Brazil, which took 187,925 bbls. The value, however, is lower, being but $424,143. In 1917, Brazil took 113,090 bbls., worth $216,142 and in 1916, 143,905 bbls., valued at $189,489.

With the restoration of something like a stable government in that country, Mexico is increasing its imports of American cement, having taken during the eight months ended with August, 90,104 bbls., valued at $242,647, as compared with 75,862 bbls., worth $188,870, in 1917, and 57,443 bbls., with a value of $106,374 in 1916.

After having reduced its imports from 51,361 bbls., valued at $76,278, in 1916, to 29,628 bbls., worth $59,296, in 1917, Peru this year is doubling its use of cement, and has already taken 68,605 bbls., with a value of $171,168.

How Other Countries Fell

The other countries, the names of which are not given by the Department, have taken 444,866 bbls., with a value of $1,159,868, as against 584,158 bbls., valued at $1,150,822, in 1917, and 434,589 bbls., worth $650,134, in 1916.

Despite our increased exports of cement, it appears that the domestic manufacturers are fast becoming more able to handle the American business, since our imports are falling steadily. During the eight-month period ended with August we imported only 35,200 lbs. of hydraulic cement, valued at $541 and other cement to the value of $9,212. During the corresponding period of 1917 the imports amounted to 138,000 llbs. of hydraulic, worth $1,208, and other cement valued at $11,892, and, during the first eight months of 1916, 528,600 lbs. of hydraulic, valued at $3,367, and other cement worth $13,398.

Bureau of Mines Wants Back Copies of "Rock Products"

The Library of the Bureau of Mines, Department of the Interior, Washington, D. C., desires to secure copies of ROCK PRODUCTS of July 3 and July 17, 1918. Will some subscriber who has these copies and does not wish them for his own files kindly send them to the editor of ROCK PRODUCTS, or to the Library of the Bureau of Mines?

Philippine Islands Buy Most Cement from China

WASHINGTON, D. C.—Complete figures of the foreign trade of the Philippine Islands during the fiscal year 1918, ended June 30 last, just made public by the War Department, show that the United States is very backward in meeting the need of the islands for cement.

Imports of cement during the year amounted to 182,205 barrels, valued at $438,453, a considerable increase over the imports of 1917, which were 160,654 barrels, with a value of $301,067. Of this amount, the United States during 1918 supplied 2,654 barrels, valued at $7,669, a great deal more, it is true, than the 48 barrels, worth $153, supplied during 1917, but still only a small part of the entire business.

The great bulk of the business is done with China, imports from that country during 1918 amounting to 114,327 barrels, valued at $280,040, as compared with 78,630 barrels, worth $151,371, in 1917. Japan, however, always with an eye to business, is going after the trade and managed to increase her share from 3,695 barrels, worth $36,378, in 1917, to 33,216 barrels, valued at $86,739, last year.

Imports from Hongkong are falling off somewhat, having decreased from 34,277 barrels, valued at $70,037, in 1917, to 12,028 barrels, worth $28,420, in 1918. Shipments received from other countries also decreased, amounting to but 19,980 barrels, worth $33,585, as compared with 44,004 barrels, valued at $43,128, in 1917.

Remember Army needs are still great—buy War Savings Stamps

The Sale of Potash Recovered from Cement Manufacture

Alpha Portland Cement Co. Has Already Established Fertilizer Trade; Strengthening Industry Against Whims of Commercial Fertilizer Manufacturers

DURING THE PAST two or three years, when the methods of Imperial Germany's propaganda were well known, much has been written of how the Germans had attempted to hold their potash monopoly by discouraging developments in the United States and other countries. The part of this propaganda exposure which did not receive much publicity was the fact that the fertilizer interests in this country were the principal agencies of the Germans for spreading this anti-home-made potash propaganda. Consequently, with the return of peace conditions, one can not help wondering how soon the fertilizer manufacturers will desert the home producers who have helped them in the emergency, for their old sources of supply.

Many good, almost unanswerable, arguments can be presented to show why the doors should be opened wide for imports of both German and Alsace-Lorraine potash salts. Germany will have heavy indemnities to pay and France has a huge national debt. Creation of national wealth is imperative and the quickest and easiest way is to develop the natural resources which are in immediate demand. The potash deposits are easily worked and a world-wide market is waiting for the product.

Preservation of the Cement-Potash Industry

Two ways are open to preserve the potash branch of the cement industry in this country, one is by Government protection through an import tariff or by subsidies; and the other is for cement manufacturers to make themselves independent of the commercial fertilizer manufacturer's demands. Most of the public expressions of Government officials on the American potash industry have been as sentimental as they have been practical. America should be made independent of outside sources, etc., etc. But business is business, and in the end the cheapest and best source of the material is the one that will be used in the trade.

Some of the most experienced and best posted cement by-product potash manufacturers contend that their product can compete with the European potash salts at prewar prices. Granting this to be true, will the fertilizer manufacturers continue to patronize American potash producers? Generally speaking, fertilizer manufacturers have persistently maintained that the cement-kiln product was inferior to the German-made article. Whether this is true or not, the quantity produced by cement manufacturers does not begin to supply their wants and they will be compelled to turn to European sources for the bulk of the material if not by choice for all their supply.

Against any Government protection of the new potash industry of this country we will have, in all probability, the full weight of the political influence of the fertilizer industry and perhaps of the agricultural interests as well. The fertilizer interests may be a powerful factor in influencing the agricultural element, as they have been in the past.

Cement Companies and Fertilizer Manufacture

The other alternative is for cement manufacturers to make themselves virtually independent of fertilizer manufacturers by themselves engaging in the fertilizer business. At least one cement manufacturer, the Alpha Portland Cement Co., of Easton, Pa., has already done this successfully and has thereby assured itself of a future demand beyond the whims of the fertilizer interests. This is the history of the Alpha's development:

With a view to recovering this valuable by-product and at the same time utilize considerable heat that hitherto had gone to waste through the cement kilns, the Alpha Portland Cement Co. early in 1917 installed a recovery system at its No. 6 Plant at Cementon on the Hudson River. This recovery installation has been in operation for some time but only recently has any announcement been made about the character of the product recovered, because the Alpha Laboratory wanted to experiment extensively with it.

The material recovered was found to contain a good percentage of both potash and lime, and the name "Alpha Potash-Lime Fertilizer" was adopted. Alpha potash-lime fertilizer is in the form of a fine powder, so fine that nearly all of it will pass the 200-mesh sieve. This is much finer than fertilizers generally. This fineness is a point in favor of the product because it mixes more readily with the soil and is more readily assimilated by plant life. Following is a specimen analysis of this fertilizer:

		Per cent
Silica	SiO_2	20.20
Oxide of Iron	Fe_2O_3	3.42
Oxide of Alumina	Al_2O_3	11.68
Calcium Carbonate	$CaCO_3$	8.70
Calcium Oxide	CaO	31.98
Magnesium Oxide	MgO	1.58
Sulphuric Acid	SO_3	8.79
Sulphur	S	0.25
H_2O at 100°	H_2O	0.04
Total Potash	K_2O	7.00
Water-Soluble Potash	K_2O	2.80

It will be seen from the foregoing that the lime elements in the material reach a total of 40 per cent. The total potash shown by the foregoing is 7 per cent, of which 2.80 per cent is immediately soluble by water. The amount of soluble potash in the material varies, sometimes running as high as 4 per cent and dropping to 2½ per cent. Therefore, the Alpha Portland Cement Co. guarantees that this fertilizer gives a minimum of 2½ per cent, although the average runs higher. The total of potash as shown by some analyses of this product runs as high as 10 per cent, though no percentages except that of the soluble potash is guaranteed.

The fineness of the material puts it in ideal form for assimilation by crops, and experiments show that the portion of potash which is not at once soluble in water becomes soluble gradually as it comes into contact with the acids of the soils. As an authority has recently expressed it: "Although this recombined potash is not extracted by the standard method of analysis for soluble potash used by the fertilizer interests it is really in an ideal form for assimilation by crops, because its slow solubility liberates the potash as needed and lessens loss through leaching."

At the present cost of potash fertilizer, Alpha potash-lime is on the market at a very attractive price. It offers an opportunity to secure two valuable fertilizing elements—potash and lime—and while the remaining elements in the material are not of any special fertilizing value in soils, they have no detrimental effect and correspond to the "filler" that is a large part of every fertilizer. It is a well-known fact that the filler in fertilizers usually amounts to about 80 per cent of the whole. Compare the prices quoted on Alpha potash-lime fertilizer with the prices quoted on the regular commercial fertilizers containing an equal amount of potash.

Laboratory experiments have shown it to be possible to so concentrate Alpha potash-lime as to secure crystals containing as high as 90 per cent of potassium sulphate, which is the form in which potash is usually found in fertilizers. Nevertheless, the Alpha Portland Cement Co. has deemed it desirable to market the product as a fertilizer in the form in which it is recovered from the kiln-stacks.

Early in the season of 1917 a considerable quantity of Alpha potash-lime was sold in several of the Eastern States and the reports from its use have been very favorable. The fertilizer has been used on corn, buckwheat, potatoes and other crops all with equal success.

Alpha potash-lime fertilizer is sold in bulk in carload lots and also in bags shipped in full or broken carload lots. The bags are not returnable. The bags contain 60 lbs. net of the fertilizer. Dealers in Alpha cement receive orders.

In using Alpha potash-lime fertilizer, a treatment of at least 500 to 800 lbs. per acre is advised, although this depends on the condition of the soil to be fertilized, and where the potash in the soil is almost entirely depleted, the application of the fertilizer should be heavier. At the reasonable price, the farmer can afford to use this material freely on many of his crops.

Alpha potash-lime fertilizer has been registered under the fertilizer laws of New York, New Jersey, Pennsylvania, Connecticut and Massachusetts. The company is selling the material at a basic price of $9 per ton—about the price of hydrated lime—in bulk with an extra charge for bags, if the shipment is so wanted. Numerous shipments have been made in bulk and no complaints have been received as to condition on receipt of shipment.

While the company guarantees only 2½ per cent water soluble potash there is good authority for holding that the remaining potash is gradually assimilated by the soil and not lost. The farmer gets his money's worth in the potash and the lime is thrown in as a bonus. Moreover the presence of the lime probably results in releasing the balance of the potash. According to the North Carolina Department of Agriculture (see ROCK PRODUCTS, Nov. 6, 1918, page 30) "The action of lime on soils well stocked with potash results in the fixation of the lime and liberation of the potash. Bousingault found that where clover was limed there was present in the crop three times as much potash as in a similar crop unlimed."

The Alpha company can readily refine its product to a high grade salt that averages about 42 per cent K_2O, which under present conditions could be sold to commercial fertilizer manufacturers at a good profit. Nevertheless the company has preferred to develop its own agricultural trade and in so doing has doubtless acted most wisely.

Cement Manufacturer's Selling Facilities

The selling methods of the cement industry through the country dealer offers in almost every instance a ready-made organization for handling a fertilizer sideline. The Alpha company has found its lime-potash fertilizer very popular with dealers.

Add to this wonderful selling organization the remarkable promotion work done by the Cement Association in increasing the use of cement on the farm, and the cement manufacturer may rest assured of entering the fertilizer field with a prestige and influence which will guarantee a future for the cement by-product potash industry, if the problem is taken up collectively.

If the Alpha company can afford to sell a ton of valuable fertilizing elements recovered as a by-product, for $9 a ton, it is apparent the fertilizer industry will have a considerable competitor to deal with, if the whole cement industry makes common cause with these pioneers who have laid the foundation of the American potash industry.

[For the data relating to the Alpha Portland Cement Co. product, ROCK PRODUCTS is indebted to S. Roland Hall, Manager of the company's Potash-Lime Fertilizer Department.]

Louisiana Gravel Man for Joint Gravel and Stone Convention

IN a letter to Walter F. Jahncke, Chairman of the Gulf States Division of the Building Materials Section of the War Industries Board, New Orleans, La., A. D. Alderson, Manager of the Tioga Gravel Co., Ltd., Alexandria, La., writes as follows:

"Respecting your request for suggestions that might be of general interest along the lines mentioned, it seems to me, and I would suggest for the consideration of your committee, a convention of sand and gravel and rock producers, to be held at New Orleans, to discuss the various features of the business relating to the Southern District especially, and the problems of transportation, freight rates, etc. I believe a joint convention of gravel producers and rock producers would be beneficial, in that, matters affecting the interests of the two industries could be discussed frankly, and a feeling of friendliness instead of antagonism might be engendered to the benefit of all producers. There will be an abundance of business of each line of products, and there should be complete co-operation on the part of the material producers looking to the protection of the industries represented, so that if necessary, sufficient influence could be brought to bear to give the Southern District a fair show.

"There is one point on which both the gravel and the rock people can work in perfect harmony, that is, on good roads, and if we follow up the road building business already started, this will supply a market for all the gravel and stone both industries can possibly produce, and it will add greatly to the amount of concrete work done. Gravel is consumed for road building and rock people will have that much more of a clear field and vice versa. Furthermore, our association will be dealing with public officials and enlisting the support of all these officials and of the farmers throughout the country, thereby making the association much more powerful and influential. It seems to me, therefore, the part of wisdom for the two associations to get together and get busy on this work, as the time is now ripe."

Stone Men — Attention! White Flag! Broken Sword!

CO-OPERATION hit Hun. United action won war. Out of empire wreck a white flag and broken sword are all that's left to William Hohenzollern.

For years Allies plodded on. Their battle line was bending. It was breaking. Different armies. Different leaders. Scattered effort. No results.

Then Foch was given right of way. Told to umpire game of war. Organization wrought victory. Thrones crumbled. Crowns tumbled. World safe. Victor and vanquished agree that Organization turned trick. Bill will swear to it.

Stone men should learn the lesson. Unite. Think and act together. Organization, in peace or war, is sanity and cents.

Big road building program looms ahead. December 11 and 12, 1918, joint session Highway Industries Association and American Association of State Highway Officials. 'Twill be clearing house of good road sentiment. All states in conference at this meeting. Ways and means sought to crystalize public sentiment. Be there. Grind your own ax. Pour water on your own wheel. Put wheat in your own mill. Help to make this meeting of such size and power that the nation will hear and heed its verdict.

Go to Chicago, if you have to borrow the money. "Good-Roadsters" will be there. Quarry men will make wages sitting in the game. United, you prosper.

A. P. Sandles, Secretary,
National Crushed Stone Association.

Post Office Department May Get Army Trucks

WASHINGTON—Airplanes and motor trucks not needed by the army after the conclusion of peace may be turned over to the postoffice department by the secretary of war under a provision of the postoffice appropriation bill for the present fiscal year.

If the parcels post system is expanded as it would be by the ownership and use of the many thousand army motor trucks the future of Federal aid for road improvement work would undoubtedly be assured.

All Rules and Regulations Restricting Construction Revoked or Modified

War Industries Board, Fuel Administration and Railway Administration Act Promptly to Encourage Building Materials Industries

EVIDENTLY there is a lively appreciation in Washington of the part that the revival of the building industries must play in the reconstruction era. The Railway Administration was the first Government bureau to act by removing all restrictions on the use of open-top cars for stone, sand and gravel.

The Fuel Administration promptly followed with the ruling that all limitations on the use of fuel in the production of building materials, including cement, lime, brick, hollow tile and lumber, have been removed, effective immediately.

This is the first fuel restriction to be removed and is lifted that there may be nothing to hamper the production of construction materials for the rebuilding of devastated Europe and the completion of projects planned in this country but postponed because of the war.

At the same time, the War Industries Board announced that its rulings upon construction had been modified to permit the free operation of builders, so far as consistent with the plans of the War Department for rebuilding in Europe and limited only by the need for economy to meet the shortages of raw materials. The board has adopted the policy of gradually lifting the various restrictions and curtailments which have been ordered during the past year, with the view of bringing about as promptly as possible a return to normal conditions.

The first restrictions to be modified were those on what had been termed non-war construction. The priorities division of the War Industries Board has announced the following new regulations:

Modified Regulations on Construction

"Section 5 of Revised Circular No. 21, issued by this Division as of date Oct. 15, 1918, dealing with non-war construction, is hereby amended so as hereafter to read as follows:

"Section 5. Construction projects not requiring permits or licenses from Non-War Construction Section—Construction projects falling within the following classifications are hereby approved, and no permits or licenses will be required therefor from the Non-War Construction Section:

"1. Construction projects approved in writing by the Facilities Division of the War Industries Board.

"2. All farm and ranch buildings, structures or improvements.

"3. All buildings, structures, roadways, plant facilities, or other construction projects of every nature whatsoever, undertaken by the United States Railroad Administration, or by any rail or water transportation company, organization or utility (whether or not under the direction of such Administration) or by the American Railway Express Company, or by the owner or operator of any telegraph or telephone line.

"4. The construction, maintenance, improvement or development, by federal, state or municipal authorities, of highways, roads, boulevards, bridges, streets, parks and playgrounds.

"5. The construction, extension, improvement, maintenance or repair of any public utility, including water supply systems, sewer systems, light and power facilities and street and interurban railways.

"6. The construction, extension or repairs of all irrigation and drainage projects.

"7. Construction of projects connected with the extension, expansion or development of mines of every character whatsoever connected with the production and refining of mineral oils and of natural gas.

"8. The construction, alterations or extensions of, or repairs or additions to, plants engaged principally in producing, milling, refining, preserving, refrigerating or storing foods and feeds.

"9. The construction of new, or the alterations or extensions of existing, school houses, churches, hospitals and federal, state or municipal buildings, involving in the aggregate a cost not exceeding $25,000.

"10. The construction of new buildings or structures not embraced in any of the foregoing classifications, or the repairs or additions to, or alterations or extensions of, existing buildings and structures, in either case involving in the aggregate a cost not exceeding $10,000.

"11. The construction of new buildings or structures not embraced in any of the foregoing classifications, or the repairs or additions to, or alterations or extensions of, existing buildings or structures, in either case involving in the aggregate a cost not exceeding $25,000; when approved in writing by the State Council of Defense or its duly authorized representative.

"12. Buildings begun prior to September 3, 1918, where a substantial portion of the building has already been constructed."

Restrictions on Manufacture of Materials

All limitations on the production of cement, lime, hollow tile, lumber, brick and other building materials are removed, and the materials so produced may be sold and delivered for use in connection with any building project for which no permit or license is required under the revised regulations, or to any project authorized by permits or licenses issued thereunder.

All limitations upon the production or use of lime or crushed or pulverized limestone in any form for agricultural uses have been removed.

All dealers, wholesale and retail, in building materials, raw, semi-finished or finished, are relieved from the obligation to give and require pledges relating to such commodities, but materials shall not be sold and delivered for use in connection with any non-war construction projects save those for which no license or permit is required or those authorized by permit or license; manufacturers, however, will continue to give pledges and comply with all pledges heretofore or hereafter given.

The priorities division announces that, so far as practicable, it will assist the industry in procuring materials, fuel, transportation and labor to enable it to increase its operations to normal limits as rapidly as conditions may permit. It is pointed out, however, that precedence must be given to industries having to do with the more vital matters of food and fuel, and materials, equipment and supplies required for the reconstruction and rehabilitation of the devastated territories of Europe.

Beginning Made on Labor Problem

At a meeting attended by the Secretary of the Navy, the chairman of the Shipping Board, and the Secretary of War, it was decided, in view of the signature of the armistice, to issue immediate directions to cut out all Sunday work and overtime in Government construction and in Government-owned or controlled plants and plants producing war supplies.

The readjustment of the labor and industry of the country which has been occupied in war work will be undertaken in conference with the Department of Labor and the War Industries Board, with a view to bringing about the readjustment with the least dislocation of labor and the greatest facility possible to be afforded for the re-establishment of industry. Many Government activities, like the shipbuilding industry, will continue uninterruptedly; others will be gradually readjusted. Meantime, those who are employed by the Gov-

ernment or working on the production of Government supplies will probably continue at their occupations.

Cancellation of War Contracts

Chairman Baruch has announced an agreement of all the war making branches of the government under which the cancellation of war contracts will be reported to the War Industries Board "in order that materials, labor, and facilities may be diverted in orderly fashion to the civilian needs."

The board also will advise the war making agencies on the cancellation of contracts in order to prevent sudden shutdown of factories.

Many war industries probably will be transformed into reconstruction plants employing as much labor and material as at present in manufacturing commodities demanded by the huge program for the rehabilitation of Belgium, France, Serbia, and Russia at the expense of Germany.

An enormous amount of steel will be required for this purpose and the steel plants will be kept running on practically a war schedule to turn out the materials needed for the reconstruction work abroad.

Agricultural Lime to the Front

Director Camp of the Agricultural Bureau of the Lime Association Visits Experiment Stations—Results Are Gratifying

FOLLOWING the modification of Circular No. 9 of the War Priorities Board respecting the use of agricultural lime, which places the distribution and restrictions of use up to the various state agricultural authorities, Director Henry M. Camp, of the Agricultural Bureau of the Lime Association, started immediately on a tour of the Eastern States Agricultural Experiment Stations. The results of this trip are very gratifying to agricultural lime producers in showing the strong hold that they are getting in agricultural circles.

Through Mr. Camp's visit the State Experiment Stations are being informed fully of the various operating difficulties in the industry, under the existing emergency, with the view of having all extension workers, county agents, and others engaged in service to the farmers of the country, understand that only with a wider distribution of the agricultural demand for lime products can the industry supply such requirements. All Directors of Extension Service should urge farmers, through the medium of Farmers' Institutes, various announcements, and personal work, to order their Spring 1919 lime supply for delivery in December, January, and early February, thereby relieving the usual heavy strain on the industry which occurs during the months of March, April and May of each year. A great many orders for agricultural lime, during the recent Fall liming period were canceled because of inability of manufacturers to make shipments when desired by farmers. Under the present limited labor, coal and car supply, it will be a physical impossibility for the lime industry to produce and move the spring orders for its products, unless a greater co-operation can be had from the farmer patrons whom the lime industry is trying so hard to serve.

The emergency practice of winter liming, is also being discussed with the State College officials, as labor in winter time is likely to be more available for hauling and applying the lime. A survey of the recommendations of the Colleges shows that it is quite generally conceded by prominent agriculturists, that when the condition of the soil shows the need of lime, it is much better to apply the lime in the winter than to not apply it at all.

These visits at the State Colleges will result in not only an adjustment of the situation, with respect to early ordering and delivery, but they will further bring these official agricultural institutions in closer touch with the distinct service that can be performed by the Lime Association, in seeing that the needs of the farmers are supplied in an efficient manner.

ALL restrictions on the manufacture and use of agricultural lime and limestone have been removed. All together now to Feed Starving Europe! The extending use of agricultural lime will help.

Maryland Agricultural College

Conference with officials of this college disclosed the belief by them, that the availability of lime for soil treatment is most important at this time, in view of their recommendation that new and worn out lands be made productive through initial treatment with lime for the growing of legume crops. Dr. Patterson, director of the college, maintains the position that lime is needed in the improvement of such lands, before any thought need be given to use of fertilizers, and that the farmers should be furnished with such amounts of lime as are shown to be required under their respective crop rotation methods; further there should be no interference with the annual liming practice, required under the rotation system.

It was pointed out by Director Patterson, that the regular use of lime in connection with the maintenance of a sufficient amount of organic matter, was most important, and that all regulations prescribing the use of lime, with due regard to conservation of fuel, labor, and car supply, should be governed by the necessity of its use in preserving the maximum production of crops, in response to the Government appeal for greater agricultural yields. It was agreed at this college, that through the medium of Farmers' Institutes, monthly and special publications, and the personal work of County Agents, that farmers would be informed of their duty in anticipating their lime requirements for the coming Spring and urged to order their supplies for delivery well in advance. The subject of early ordering of lime will be discussed at farmers' meetings, and will also be treated in articles published from time to time in the College Journal, and other efforts along these lines will be engaged in, in the hope that the delivery service required of our industry will be given reasonable co-operation.

Delaware College of Agriculture

Professor Hayward, director of the Experiment Station of this College, and Professor Grantham, director of the Department of Agronomy, were conferred with. Both officials were of the opinion that farmers of the state of Delaware were not using enough lime for the healthy production of crops, and that no interruption to its availability should take place. It was learned that some very important experimental work is being conducted at this station, with the use of legume crops and lime for supplying the nitrogen element of plant food. These tests disclose that the importance of regular liming under the recognized crop rotation methods, is assured. Recommendations to the farmers of this state have been made by the station, to not overlook the practice of soil liming.

Both Director Hayward and Professor Grantham agreed that farmers should be permitted to receive such amounts of liming material as are shown to be required under their respective crop rotation systems and that it had been learned through past experience by the college, that largely on account of the price and labor required to haul and apply it, the average farmer rarely purchased more lime than the condition of soils showed to be needed. The Delaware Station will begin the issue of a monthly publication to farmers in November, 1918, when an article will appear on the urgency of the importance of the ordering of lime, and the necessity of its continued use in the growing of crops re-

quiring a neutral or alkaline soil. As in the case of the Maryland College, the subject of liming and early ordering will be touched upon at Farmers' Institutes, and by County Agents in their personal work with farmers throughout the state.

New Jersey and New England

Dr. J. C. Lippman, director of the New Jersey State Experiment Station, holds the opinion that there is no restriction needed in the use of agricultural lime, because farmers do not buy more than they need. He believes further, in the early ordering of lime for agricultural purposes and will issue publicity on this point throughout the state of New Jersey. He proposes at an early date to have a conference with County Agents and extension workers on the matter of the regulation of the use of lime, and also on the general subject of liming, encouraging farmers to use more of it than they have in the past. Dr. Lippmann was extremely pleased by the Lime Association offers of co-operation and promised to keep closely in touch with the association, as his efforts in this direction develop.

At the Connecticut Agricultural Experiment Station, Dr. E. H. Jenkins, director, was strongly of the opinion that farmers should use much more lime and that no restrictions on them were justified and that every effort should be made to bring about continued and uninterrupted use of lime on the lands of Connecticut. He offered to help in efforts in this behalf. At the Connecticut Agricultural College, Dr. H. J. Baker, director of the Extension Service, and I. J. Davis, were in full and complete accord with the Lime Association in this matter. They both felt that demonstrations on farms in Connecticut were of importance and plot tests were exceedingly necessary. They said that no restrictions would be placed on Connecticut farmers in the use of agricultural lime and that this fact would be published throughout the state in the form of an order to County Agents to this effect.

Southeastern Limestone Producers' Association Meets

Individual Members Ready to Assume Responsibility for Necessity of Product

MEETING in Knoxville, Tenn., Nov. 8, the Southeastern Limestone Producers' Association passed the following resolution:

"It is the sense of this meeting that the recent ruling of the Priorities Board at Washington, D. C., incorporated in Circular No. 9, dated Aug. 1, 1918, and pertaining to the distribution of all agricultural limestone, and particularly referring to the statement of Rhodes S. Baker, Assistant Priorities Commissioner, interpreting and modifying the Circular No. 9 as follows:

The state official having supervision of agricultural production, or soil conservation (usually the State Director of Extension of the state where lands are situated), may supervise without direction or permit from this division the distribution and use of burnt lime and ground limestone for agricultural purposes, and any manufacturer, producer or dealer in burnt lime or ground limestone, may supply such products for agricultural purposes, under such ruling and regulations as may be prescribed by such state officials.

This modification of Circular No. 9 shall not be construed or interpreted as modifying in anywise the distribution of lime for use other than for agricultural purposes, which places the responsibility of the proper distribution of this limestone upon the State Director of Extension.

"We feel that since the furnishing of certificates by the farmer for his requirements as required, where he uses more than one ton of limestone, which certificate must be approved by the county agricultural agent and the State Director of Extensions, places the burden upon the user that will materially curtail the use of agricultural limestone by the farmer, and consequently reduce the production of food stuffs.

"WHEREAS—

"We, the Southeastern Limestone Producers' Association, desire to shift the responsibility to the individual manufacturer. Be it therefore resolved:

"That we recommend to the various State Directors of Extension that they place the manufacturer of agricultural limestone upon his honor, not to ship agricultural limestone for any other purpose except agricultural, and if orders should be received for this material, to be used for purposes other than agricultural, then the manufacturer will require from such purchasers, priority certificates. By doing this, we believe that we will be complying with the spirit of the Priorities Board order, as incorporated in this Circular No. 9, dated Aug. 1, 1918, and being in each respect in accordance with the ruling."

The rest of the meeting was devoted to a discussion of the possibilities of agricultural limestone in the South and of methods of sale and distribution.

Following the meeting the party adjourned to the Tennessee Agricultural Experiment Station, where an interesting inspection was made of the research work done there under the supervision of Prof. W. H. MacIntire. Some of the principal experiments are with the effects of various soil treatments of lime and limestone.

After luncheon the party was driven to Mascott, Tenn., where the big stone plant of the American Ballast Co. was inspected. This company also operates an experimental farm, well stocked with native cattle, the object of which is to provide an example of good farming methods for the country roundabout. For their splendid entertainment the party was indebted to Thos. McCroskey, general manager of the American Ballast Co. Among the guests were J. C. King, president of the National Agricultural Limestone Association and G. J. Wilder, its secretary.

New York State Agricultural Authorities Confer with Limestone Producers

A CONFERENCE was held at the Lafayette Hotel, Buffalo, N. Y., Nov. 12, at the call of Professor Fippin, New York State Agricultural College, Cornell University, to discuss the new ruling of the Priorities Board on agricultural lime and limestone.

The morning session of the meeting was taken up by the manufacturers, who presented their arguments against the farmer being required to fill out a certificate before securing his limestone.

The State Directors of Extension felt, however, that it was necessary for them to take some action relative to the modified ruling in Circular No. 9, of the Priorities Division of the War Industries Board, therefore, the meeting was adjourned at 12:30 p. m. in order to give this committee of State Extension Directors an opportunity to present their requirements.

At luncheon all were the guests of the Michigan Limestone & Chemical Co.

At 2:30 a. m. the Extension Committee reported with a recommendation that the manufacturers on and after Nov. 15 be required to fill out blank forms in duplicate, showing the amount of burnt lime, ground lime and ground limestone produced and to whom and where shipped, not later than from the 1st to tne 10th of the following month.

One copy of this report will go to the State Director, the other one to the county agent of the county in which these materials are shipped. This will give to the State Directors and county agents valuable data and will, no doubt, be for the benefit of all, inasmuch as their interests are one. At the present time this only applies to Ohio, Pennsylvania and New York.

The manufacturers at this meeting urged uniformity of regulations all over the United States, and Professor Fippin has been advised to get out a circular letter to all other State Directors of Extension, advising them of the action taken at this meeting and expressing the hope that they would likewise see fit to adopt the same form of regulation.

Decarbonation of Dolomite Limestone in the Rotary Kilns

Results of Experiments at Cedar Hollow Plant of the Charles Warner Company

By E. E. Eakins
Chemist, Chas. Warner Co., Devault, Pa.

TO DETERMINE if possible the points at which decarbonation of our stone commences and the point at which it is complete, it was decided to investigate the contents of our rotary kiln during a recent shut down. This work was undertaken with no intention of making a scientific research, but merely as a matter of general plant information. Results alone are given, and these are published only as a matter of general information for those who may be calcining limestone in a rotary kiln.

The limestone used in our kiln is the well known Cedar Hollow stone crushed to pass a 1-in. screen. All fine material (screenings) is removed.

The rotary kiln is of the usual type used in cement practice 150 ft. long by 6 ft. 6 in. inside the lining, which is of clay brick well grouted with cement. The inclination is ¾ in. per foot*. The kiln rotates normally at the rate of one revolution in one minute and forty seconds. The feed is continuous, and the output of the kiln averages 100 tons of burned lime per 24 hours.

Firing is by producer gas from two Chapman producers rated to gasify 18 tons of coal each per 24 hours. The fuel used is a low sulphur semi-gas coal, averaging about 30 per cent volatile combustible matter.

It has been impossible to secure accurate temperature measurements inside the kiln proper. The temperature of the gas taken at the port just before its entrance to the kiln varies from 1,500 deg. F. to 1,600 deg. F., while the temperature of the stack gases, taken in the dust chamber at a point where they are undiluted by cold air, varies from 1,100 deg. F. to 1,300 deg. F.

The stone is present in the kiln to a depth of 12 or 14 in., and samples were taken from a point about 3 in. below the surface to the bottom of the mass. Only clean lumps ½ in. or larger were taken for the sample. Samples were taken at the intervals specified in the table, starting at the discharge end of the kiln. Each sample was analyzed for carbon dioxide, examined macroscopically and microscopically.

Macroscopic Examination

The sample taken at 0 ft. (discharge end) showed no evidence of core when the lumps were broken open. The CO_2 content is apparently due to recarbonation from the air.

The sample taken at 10 ft. showed slight evidence of core. The quantity of core increased in each sample up to the sample taken at 40 ft., which was hard like stone but lacked the full crystalline character of limestone.

From 40 ft. to 75 ft. the similarity in appearance of the samples to limestone progressively increased, and at the latter point the material was apparently unchanged limestone.

CHEMICAL ANALYSIS

Distance	Percent CO_2
0 ft.	1.02
10 ft.	2.35
20 ft.	4.68
30 ft.	21.46
40 ft.	37.12
50 ft.	42.20
75 ft.	42.92
100 ft.	42.96
125 ft.	43.09

Microscopic Examination in Polarized Light

In addition to the chemical analysis recorded above, all samples were examined under the microscope, with very interesting results.

The sample taken at 125 ft. was completely crystalline in character, excepting a small amount of impurities, and corresponded in all respects to our raw stone.

At 100 ft. the quantity of non-crystalline amorphous matter showed a slight increase, due to the decomposition of some magnesium carbonate.

From 100 ft. to 30 ft. the amorphous material progressively increased in quantity, and at 30 ft. the first evidence of free CaO was obtained.† The quantity of free CaO then increased rapidly to the 0 ft. mark where it reached its maximum.

At 10 ft. there was very slight evidence of crystalline $CaCO_3$.

At 0 ft. there was no evidence of crystalline $CaCO_3$.

Comparison of Results

The results of the microscopic examination and chemical analysis check reasonably closely.

An average analysis of the stone supplied the rotary kiln would be as follows:

CaO	29.12%
MgO	19.40%
CO_2	44.22%

This percentage of CaO requires 22.88 per cent CO_2 for conversation into $CaCO_3$, while the MgO requires 21.34 per cent CO_2 for conversion into $MgCO_3$.

At 40 ft. from the discharge end, the contents of the kiln show 37.12 per cent CO_2 present, or more than enough to satisfy all the CaO.

At 30 ft. from the discharge end, the contents of the kiln show 21.46 per cent CO_2 present or less than the quantity necessary to satisfy all the CaO.

The microscope shows that no free lime is present 40 ft. from the discharge, but that considerable free lime is present 30 ft. from the discharge.

Conclusions

From the above results, we may then draw the following conclusions:

1. The first decomposition of the stone takes place about 100 ft. from the discharge end of the kiln.

2. This decomposition is entirely of magnesium carbonate, and increases gradually until a point is reached between 30 and 40 ft. from the discharge, where the $CaCO_3$ first decomposes and free lime is obtained.

3. The production of CaO in our rotary kiln takes place entirely in the last 30 or 40 ft. of the length of the kiln, and is not complete until the last 10 ft. of the kiln is reached.

* This is greater than is usual in cement practice.

† The presence of free lime was determined by refractive index and also by treatment of sample on the slide with White's solution, and the subsequent production of strongly double refracting needles of calcium phenolate.

Lime Men Work on Plaster Sand Specification

NORMAN G. HOUGH, chief of the Construction Bureau of the Lime Association, has been charged by Committee C-7 on Lime of the American Society for Testing Materials with recommending a standard sand for plastering purposes, and he is devoting considerable study to the matter at this time. The first step is to analyze sand generally for plastering purposes in the larger markets. Requests for 5-lb. samples have been made from New York City, Philadelphia, Wilmington, Atlanta, Cleveland, Chicago, Indianapolis, Cincinnati, Toledo, Detroit, St. Louis and Kansas City producers. All other sand producers who make a good grade of plastering sand used in markets other than those mentioned, that can be used in this study, are invited to send 5-lb. samples to the U. S. Bureau of Standards, 40th and Butler-sts, Pittsburgh, Pa.

Production of Lime in the United States

THE FINAL FIGURES for lime burned and sold in the United States in 1917 are 3,786,364 short tons, valued at $23,807,877, as determined by G. F. Loughlin, United States Geological Survey. This is a small increase over the estimate made in February, which was based on returns received from the principal producers, but it represents a decrease of 7 per cent from the total for 1916, which was 4,073,433 short tons. In spite of the decrease in quantity there was an increase in value of 28.6 per cent over that in 1916. Only 595 plants were in operation in 1917 in comparison with 778 in the previous year. The average price per ton, which for a number of years has been within a few cents of $4, rose to $6.29 in 1917.

Marketed More Than 50,000 Tons

The following table shows the output of all States that marketed more than 50,000 short tons:

Lime Produced in 1917

State—	Total Lime		Hydrated Lime	
	Tons	Value	Tons	Value
Pennsylvania	936,209	$ 5,900,056	142,254	$ 974,936
Ohio	479,856	2,975,466	316,252	2,038,944
Virginia	307,195	1,820,446	7,393	46,864
West Virginia	245,569	1,268,343	51,545	274,718
Missouri	234,936	1,435,914	32,120	219,600
Wisconsin	169,650	1,037,578	(*)	(*)
Michigan	135,920	892,682	(*)	(*)
Massachusetts	134,937	916,569	(*)	(*)
Maryland	133,087	694,576	20,580	143,133
Maine	124,199	950,811	.....	.....
Indiana	118,530	646,555	21,867	134,835
New York	108,788	892,855	8,562	58,852
Tennessee	101,836	504,599	18,594	126,455
Illinois	83,409	501,320	(*)	(*)
California	78,401	597,528	3,512	31,529
Alabama	66,744	383,211	6,541	48,089
Connecticut	64,389	492,678	(*)	(*)
Texas	52,742	361,308	13,999	93,861
Other States	209,967	1,535,382	65,938	451,188
	3,786,364	$23,807,877	709,157	$4,643,004

* Included in "Other States."

The quantity of hydrated lime manufactured and sold in 1917 was 709,167 short tons, valued at $4,643,004, in comparison with 717,382 tons in 1916, valued at $3,626,998. This represents a decrease of 1.5 per cent in quantity and an increase of 28 per cent in value. The average price per ton of hydrated lime was $6.54 in 1917, an increase of $1.48 over the average price of 1916. The hydrated lime sold for use in buildings amounted to 402,223 tons, and that sold for use in agriculture to 177,815 tons, slight decreases from the previous year. There were 90 hydrating plants in operation.

Lime Sold in 1917, in Short Tons

	Total Lime	Hydrated Lime
Building	1,313,597	402,223
Fluxing	209,976	.....
Chemical works	772,787	52,255
Paper mills	355,768	6,728
Sugar factories	47,546	5,227
Tanneries	66,629	13,979
Glass factories	60,624	3,277
Agriculture	488,297	177,851
Dealers and others	471,244	47,653
	3,786,468	709,157

There was a decrease in the quantity used for building and for agriculture, and an increase in that used for fluxing, chemical work, paper mills, and tanneries.

Hydrated Lime in Concrete Roads

UNDER the above title the construction bureau of the Lime Association, of which Norman G. Hough is chief, has issued an attractive eight-page booklet. The contents are extracts from a report of the Delaware State Highway Department. In explanation of this booklet Mr. Hough writes:

The bulletin gives the results of the first test that has been conducted to show the effect of hydrated lime in concrete when placed under actual field conditions.

The effect of the hydrated lime seems rather remarkable, but when one considers the detrimental effect that excessive quantities of water have on the ultimate strength of concrete and that any decrease of excess water manifests itself by an increase in strength, the results are quite logical.

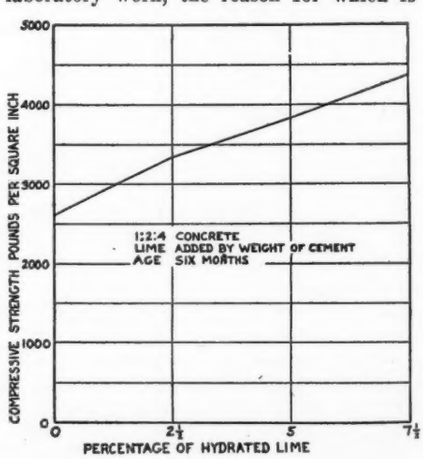
The increase in strength can undoubtedly be assigned to two reasons:

First, as the hydrated lime was increased, the flowability and workability of the mixture was improved to such an extent as to permit it being placed with a lesser quantity of mixing water than that required for the concrete without lime.

Second, hydrated lime is of an hygroscopic nature and absorbs water at the time of mixing. This water is held mechanically by the lime, but it cannot be utilized in any chemical combination while the lime is hardening. The cement, however, has a chemical attraction for moisture during the seasoning period which is much stronger than the mechanical attraction of the lime. The moisture is therefore drawn from the lime and utilized by the cement in the process of more nearly complete hydration, thus resulting in increased strength.

With these two statements the increases in strength shown are explained. The Highway Department of Delaware are large users of hydrated lime in concrete, hence the reason for their conducting the investigation.

As mentioned above, this is the first test published on this subject which indicates the performance of hydrated lime in field practice, and this makes the information so much more valuable. It has been the contention of those who have closely studied this subject, that the true value of hydrated lime in concrete is not so pronounced in laboratory work, the reason for which is fully covered on the last page of the pamphlet, but in field practice, the conditions being vastly different than in the laboratory, the possibility for improvement is much greater, and a material having the properties of hydrated lime has a much better opportunity to do its work.



Mr. Hough's booklet should result in greatly extending the use of hydrated lime in concrete road work—a field which has hitherto been the subject of considerable controversy.

Production of Lime in British Columbia

A REPORT on the rock products and building materials of British Columbia for 1917 has been issued. The manufacture of lime was conducted in a small way at a large number of points in the province but only on the coast has any attempt been made at more extensive operation.

In the neighborhood of Victoria, on Esquimalt Harbor, three kilns are in operation and there are three kilns on Saanich arm. On Texada island (in addition to the old plant at Marble Bay), a new and extensive plant was erected at Blubber Bay a few years ago.

The limestone being used is of exceptional purity, but in some instances the limestone beds are cut by igneous dykes which have to be rejected, and this somewhat increases the cost of quarrying.

Production of Native Magnesite Falls Off Substitutes Are Used

Industry in California and Washington Suffers from Long Freight Haul—Analyses of Native Magnesites

ACCORDING to R. W. Stone, of the United States Geological Survey, Department of the Interior, the production of magnesite in the six months ending June 30, 1918, was about 93,700 short tons, of which California produced more than half.

According to the best figures available the California output was about 47,600 tons of crude magnesite and the Washington output was 46,100 tons. Only two companies were producing in Washington, and one of these stopped quarrying from February to May in order to enlarge its calcining plant and develop the deposit. The rate of production in California is about 50 per cent less than in 1917, and the rate in Washington is about 88 per cent of that of last year. The output of California in the second half of 1918 will probably be no larger than in the first half, but that of Washington may be much larger, for development has now reached a stage where rock can be quarried, calcined, and shipped at an increased rate. The production for the entire year may be about 225,000 tons, as against 316,000 tons in 1917.

Freight Rate Reduces Demand

The increased freight rate and the importation of magnesite from Canada have greatly reduced the demand for California magnesite for use as a refractory material, so that all the small and some of the large producers have stopped work, and the others are operating with reduced force.

Some manufacturers of refractory products in the eastern states who used large quantities of California and Washington magnesite in 1917 are now using a considerable quantity of Canadian magnesite instead of the more expensive domestic material. The Canadian magnesite, which comes from Grenville, Quebec, is crystalline, but it carries a high percentage of lime. Extensive masses of Canadian magnesite average from 7 to 10 per cent of lime. It can be delivered by boat to Buffalo, Cleveland and Chicago at much lower cost than magnesite can be brought from California and Washington, and is being substituted for the higher grade domestic material.

Importations Increasing

In 1917 this country imported 2,148 tons of Canadian calcined magnesite, and in the first five months of 1918 we imported 5,809 tons. The imports of calcined magnesite from Canada in April, 1918, were more than the total imports from Canada in 1917, and the imports in May nearly equaled those of the previous year.

Analysis of crude and calcined magnesite from California and Washington.

[Chase Palmer, analyst.]

	1	2	3	4	5	6	7	8	9	10	11	12	13[a]	14	15
SiO_2	1.94	2.43	2.26	4.35	12.65	13.88	2.57	14.72	8.73	9.57	1.82	0.80	0.50	2.70	1.67
FeO	1.49	2.40	2.11	1.71	.80	1.49	.89	1.35	.97	1.00	.50	.20	[b]43	.23	.31
CaO	.67	1.57	1.52	2.11	.95	.27	.80	.64	.39	2.83	1.85	1.92	4.90	.80	1.17
MgO	45.01	43.62	44.10	42.62	40.73	39.60	45.65	39.60	43.18	42.48	45.12	45.90	83.17	46.02	45.75
CO_2	50.65	50.11	50.18	49.05	44.64	44.62	50.33	43.73	46.31	44.70	50.73	51.68	11.34	50.32	50.93
	99.76	100.13	100.17	99.84	99.77	99.86	100.24	100.04	99.58	100.58	100.02	100.20	100.34	100.07	99.85

	16[a]	17	18	19	20	21	22[a]	23	24[a]	25[b]	26[a]	27	28	29
SiO_2	0.51	12.05	2.40	0.65	6.37	1.10	5.21	1.85	5.56	5.33	1.20	4.27	4.83	5.60
Fe_2O_3	[c].57	2.83	1.44	.33	.35	.72	[c]1.70	.88	[c]1.74	1.01	[c]2.36	.78	.85	.88
CaO	2.48	1.98	3.68	2.65	2.88	1.17	2.18	1.74	2.31	.35	.92	1.07	7.39	6.88
MgO	90.30	38.88	42.56	45.43	41.55	45.64	89.08	45.20	74.39	43.52	90.59	45.02	38.41	40.90
CO_2	5.22	44.84	49.94	51.42	49.18	51.20	1.65	49.70	15.95	47.91	5.23	49.51	47.81	46.03
	99.08	100.58	100.02	100.48	100.33	99.83	99.82	99.37	99.95	98.12	100.30	100.65	99.29	100.29

[a] Calcined.
[b] This sample contains also 1.81 per cent of material insoluble in acid.
[c] Fe_2O_3.

1. White Rock mine, bunker, Pope Valley, Napa County, Cal.
2. White Rock mine, east vein, stock pile, Pope Valley, Napa County, Cal.
3. White Rock mine, upper tunnel, Pope Valley, Napa County, Cal.
4. Tulare Mining Co., Blanco mine, stock pile, Chiles Valley, Napa County, Cal.
5. Soda Creek mine, Detert & Elder, south tunnel, stock pile, Soda Valley, Napa County, Cal.
6. Soda Creek mine, north tunnel, stock pile.
7. Harker quarry, stock pile, Gilliam Creek, Sonoma County, Cal.
8. Sonoma Magnesite Co. lower mine, stock pile, Austin Creek, Sonoma County, Cal.
9. Sonoma Magnesite Co. upper mine, stock pile.
10. Cedar Mountain mine, Clark & McDonald, sacked for shipping, Alameda County, Cal.
11. Western Magnesite Development Co., White Queen mine, 250 feet inside tunnel, Red Mountain, Santa Clara County, Cal.
12. White Queen mine, stock pile.
13. White Queen mine, kilns.
14. Pacific mine, bunker, Red Mountain, Santa Clara County, Cal.
15. Red Mountain Magnesite Co., Butcher mine, bunker, Red Mountain, Stanislaus County, Cal.
16. Butcher mine, cooling bins.
17. McLaughlin mine, stock pile on loading platform, Bradford ranch, Evergreen, Santa Clara County, Cal.
18. Jackson mine, stock pile, Cochrane ranch, Morgan Hill, Santa Clara County, Cal.
19. Warwick mine, lower cut, stock pile, Madrone, Santa Clara County, Cal.
20. Warwick mine, upper cut, stock pile.
21. Hoff-Price Co. mine, stock pile, Sampson Peak, San Benito County, Cal.
22. Hoff-Price Co. mine, cooling floor.
23. Northwest Magnesite Co., Finch quarry, five freight cars, Chewelah, Stevens County, Wash.
24. Northwest Magnesite Co., cooling floor at kilns.
25. American Mineral Production Co., bunker at Allen quarry, Valley, Stevens County, Wash.
26. American Mineral Production Co., cooling floor at kilns.
27. American Mineral Production Co., Red Marble quarry, stock pile.
28. U. S. Magnesite Co., upper 40 feet of quarry 18 miles west of Springdale, Stevens County, Wash.
29. U. S. Magnesite Co., 18 feet in middle of quarry.

Analyses of Magnesite

In the summer of 1917 Mr. Stone visited the magnesite field in Washington and many of the fields in California and collected samples for analyses. Of the 29 samples analyzed 24 were crude magnesite and 5 were calcined.

The results of the analyses made in the laboratory of the United States Geological Survey are given in the adjoining table:

This is the largest number of official analyses of California and Washington magnesite that has yet been published. Of all the California magnesite here shown, that of the White Rock mine, Napa County, Cal., is highest in iron content and at the same time reasonably low in silica and lime. Material from two small properties (Nos. 17 and 18) in Santa Clara County carries as much iron, but one is high in silica and the other is high in lime. The White Rock mine is supplying much of the calcined magnesite used by steel mills on the Pacific coast. Some of the California magnesite that is very high in silica is used for plastic purposes and is said to be satisfactory.

Washington Magnesite Crystalline

Washington magnesite is crystalline, like marble or dolomite, and unlike the noncrystalline California magnesite. Many analyses of Washington magnesite made by reputable chemists have shown 1 to 3 per cent of calcium oxide, 1 to 2 per cent of iron oxide, and silica commonly between 2 and 6 per cent. It should not be concluded from the analyses herewith that the magnesite from the Finch quarry (23) is commonly so low in silica or that from the Allen quarry (25) commonly so high as shown. The magnesite represented by analyses 28 and 29 was considered inferior and production at the U. S. Magnesite Co. quarry discontinued after a few weeks.

Do not forget that War Savings Stamps are not for children only. Most of the squandering is done by the grown-ups.

Two New Silica Sand Associations

Eastern Ohio and Western Pennsylvania Producers Organized in American Sand Association—Illinois Men Organize

MORE EVIDENCE of the good which the win-the-war spirit of co-operation did for rock products producers are two recently organized silica sand producers' associations. The oldest of these is the American Sand Association with headquarters in Cleveland, Ohio, and the most recent the Silica Sand Producers' Association of Illinois, with headquarters at Ottawa, Ill., the home of the famous "standard Ottawa sand."

The American Sand Association is an outgrowth of the old Ohio Sand Traffic Association. It is an association of both silica and gray iron molding sand producers. Membership is largely confined to producers in Ohio and Western Pennsylvania. The present membership numbers about 25 and there is a steady healthful growth predicted. Meetings are held every month, alternately in Cleveland and Pittsburgh.

Besides the active members there are associate members in the East and as far West as Chicago. In all about 70 plants supplying the iron and steel trade with gray iron and steel molding sands are represented in the association.

The object of the association as stated in the preamble of its constitution is:

"To maintain and improve the quality of their commodities, to encourage efficiency of production and more scientific methods of marketing, to secure equitable freight rates and classifications, to disseminate proper credit information, to foster and promote harmony and friendly relations and the exchange of ideas among producers, and to do generally those things which shall place the industry on a more substantial and prosperous basis."

An open price policy, similar to that of the Eastern Crushed Stone Association, is incorporated in the constitution of the association. Any individual, firm, or corporation, actively engaged in the manufacture of silica and production of moulding sand, is eligible to active membership in this association, provided the conduct of his or its business accords with the requirements and standards set forth in the Constitution and By-Laws. The dues of active members are $25 a year and such tonnage assessments as may be necessary to carry on the work of the association.

The constitution makes it the duty of every member to promptly harmonize his cost-finding system with the "Base Plan for Cost Findings" of the Association. For failure to live up to the constitution and admirable code of ethics, printed herewith, a member forfeits his membership.

The officers of the American Sand Association are: H. C. Koontz, president, of the Superior Sand Co., Cleveland, Ohio; H. C. Leonard, first vice-president, of the Oliver Silica Sand Co., Massillon, Ohio; M. McC. Everhard, second vice-president, of the Everhard Co., Massillon, Ohio; Hubert B. Fuller, secretary-treasurer, Cleveland, Ohio.

CODE OF ETHICS
OF
THE AMERICAN SAND ASS'N.

1. That it is not the desire of this Association to require of its members any acts which will, in any way, infringe upon the laws of this country.

2. That the Association condemns, in no uncertain terms, the practice of accepting orders for larger quantities of silica or moulding sand than can be delivered with reasonable assurance.

3. That this Association condemns the practice of "knocking" competitors' materials or casting aspersions that may be detrimental to the general silica and moulding sand business, and recommends that its members insist that their employees and selling connections refrain therefrom.

4. That this Association condemns the practice of continued solicitation of a prospect after it becomes an order, and recommends that its members and their salesmen cease all selling efforts as soon as an actual sale is made.

5. That this Association condemns the practice of misleading advertising and misrepresentation as to quality of material.

6. That this Association condemns the practice of selling sand without first knowing positively the exact cost price, and favors a uniform cost accounting system.

Ottawa Silica Sand Producers Organize Locally

OTTAWA, Ill.—Exigencies of war and the vision of post-war business development brought together in the Ottawa silica district recently a number of the leading producers of silica sand, who had learned by their own experience and by observation that organization is one of the surest means of bringing about the greatest good to an industry. The result was The Silica Sand Association of Illinois which is now in the process of formation.

J. F. Blakeslee of the Utica White Sand Co. of Utica, has been acting chairman, pending the election of permanent officers and the engagement of a paid executive secretary. Paul G. Bechtner of the Higby Canyon Sand Co., who had been acting secretary and treasurer, is now in an army training camp.

Ten producing companies along the Chicago, Rock Island & Pacific Railway, the Illinois & Michigan Canal and the Illinois river have joined the association and are giving it hearty support. They include producers of all the varieties and grades of silica sand: blast, glass, molding, core, furnace bottom and some special grades.

Headquarters have been established in the Central Life building, Ottawa, Ill.

The Ottawa district is world famed because of its high quality of silica sand. Its activities center in the eight or ten miles between Ottawa and Utica in which area the ten companies mentioned have their pits. Buffalo Rock also comes within this area close to Utica, an elevation that contains also deposits of yellow clay shale, bluish gray shale or soapstone, coal and fire clay. St. Peter's sandstone, which outcrops in this district, furnishes all the varieties of silica sand.

"We want all the advantages that an organization can give us in protecting our interests where they may need protection, and in furthering our collective business interests," said Mr. Blakeslee to a ROCK PRODUCTS representative. "That all our objects may be maintained we have established a headquarters and have been seeking a man to serve as paid executive secretary and traffic man."

R. I. Thornton of the Illinois Valley Silica Co., said that Ottawa silica is being shipped all over the western hemisphere.

"By the end of the year there will have been shipped from this district," said Mr. Thornton, "60,000 carloads. We confidently expect to ship 100,000 carloads yearly with the proper kind of promotional work."

Production of Granite for Building Stone Falls Off

Cut-Stone Business of Quarrymen Suffers Acutely from Decreased Building Activity

THE total value of granite sold for building stone in 1917 was $2,881,128, a decrease of $1,083,305, or 27 per cent, compared with 1916. The rough stone sold was valued at $590,310, which was $312,736, or 35 per cent less than in 1916; the dressed or manufactured stone was valued at $2,290,818, which was $770,569, or 25 per cent less than in 1916. Accurate figures showing quantities are not yet available, but owing to a general increase in price the decrease in percentage of output was considerably more than that in value.

The statistics given were compiled under direction of G. F. Loughlin, of the United States Geological Survey, in cooperation with the National Building Granite Quarries' Association and the State Geological Surveys of Georgia, Maryland, Minnesota, Missouri, New Jersey, New York, North Carolina, Pennsylvania, Virginia, Washington and Wisconsin.

Sales of granite for building were reported from 26 states in 1917 compared with 28 in 1916. Massachusetts, with a total value of $646,506, and Maine, with $525,604, ranked first and second. New Hampshire, second in rank in 1916, was third in 1917, with a value of $337,233. Massachusetts, with $132,700, and Maine, with $100,941, were the only States whose sales of rough granite exceeded $100,000 in 1917, and each of these showed a decrease of about one-third compared with 1916. New Hampshire followed with $78,484, a gain of about one-quarter. Pennsylvania, which ranked first in sales of rough granite in 1916, with a value of $224,360, was credited with only $87,978 in 1917. The few other States that showed gains had values of less than $15,000.

In sales of dressed granite also Massachusetts, with $513,806, and Maine, with $424,663, were the leading States. Maine, however, has made continuous gains in 1916 (2 per cent) and 1917 (55 per cent), whereas Massachusetts in the same years has suffered losses of 17 per cent and 19 per cent, respectively. North Carolina's output, chiefly stone for mausoleum work, though classed previously as building stone, has been transferred to monumental stone, the class in which it more properly belongs. New Hampshire, Vermont, California, Georgia, Rhode Island and Minnesota had values in excess of $100,000 in 1917. Of these Georgia made gains in the last two years, its value for 1917 nearly doubling that of 1915, and Rhode Island more than tripled its value for 1916. The other States named showed decreases of 10 to 50 per cent.

The reduced output during the last year was due to a marked increase in the cost of labor, material, and freight. The general average increase was probably about 30 per cent, but some items increased much more.

Prices increased, though in most places not in proportion to the increase in costs. Some producers reported an increase of 20 to 30 per cent. One company in Maine reported an increase of 50 per cent, and two companies in New Jersey an increase of 100 per cent for rough stone. A few companies in New Hampshire, Maryland, and the District of Columbia reported no increase in price.

The demand was prevailingly small, owing to a general curtailment in the erection of both Government and private buildings in which granite is ordinarily used. This curtailment in turn was caused by a shortage of labor for building, a shortage of other building materials, and the increased price of these materials and of building stone. New York's marked decrease was largely due to the completion of the Kensico dam, for which a considerable quantity of granite was sold in 1916. One producer in Wisconsin attributed decreased demand in part to eastern competition, and two small producers in Massachusetts complained of competition with artificial substitutes for granite. The adverse conditions compelled several quarries in different parts of the country to suspend operations.

One company each in California, Maine, New Hampshire, and Pennsylvania, reported that the demand in 1917 equaled that in 1916, and a few companies in Rhode Island, Delaware, Maryland, and Colorado reported that it was even better. Some of these, however, particularly those in Maryland, could not take advantage of the favorable demand, owing to shortage of labor and cars. The increase in Georgia, Maine and Rhode Island was due mainly to an increase in the production of a single company in each state. Arizona reported the sale of considerable granite in both 1916 and 1917.

As building operations were very active early in 1917, the curtailment in them not becoming marked until about midsummer, the production in 1917 may be considered an average between very good and very poor. The period of severe depression continued through the first six months of 1918, and as there is no prospect of early improvement the production of building stone, as well as of other materials that are used mainly in buildings of the better classes, will probably be considerably less in 1918 than in 1917. The present abnormal period, in which most of the buildings erected are temporary, will probably be followed by a period in which permanent buildings of high architectural merit will be constructed, and this change will be reflected in a rapid recovery of the building granite industry.

Rock-Product Fertilizers

THE "American Fertilizer Handbook" for 1918, has been issued. It contains the usual directories of fertilizer companies and manufacturers of fertilizer machinery. This issue is of particular interest to rock products producers for the very complete summary on Potash, by H. S. Gale, of the U. S. Geological Survey, and for the article on the "Use of Lime in Agriculture" by John H. Voorhees, former Agronomist, Agricultural Lime Bureau of the National Lime Manufacturers' Association, at Washington.

Mr. Gale's article on potash covers 14 pages and gives an excellent summary of the development of this industry in the United States. In 1916 potash from alunite and silicate rocks amounted to 1,850 tons, valued at nearly $1,000,000. Twice that amount was produced from natural salts or brines, but these sources are short-lived and if we are to have a permanent potash industry in this country it must in the end be a rock products industry.

Mr. Voorhees' article on agricultural lime is in a similar vein to his articles in ROCK PRODUCTS of Feb. 27, 1918, and Dec. 19, 1917. Lime manufacturers are fortunate to have such a favorable account of the agricultural value of lime published in handbook devoted chiefly to the commercial fertilizer interests.

Half-Year Statistics on Production of Potash

THE statistics of the production of potash for the first six months of 1918 received by the United States Geological Survey, Department of the Interior, to date show a total output of 20,000 to 25,000 short tons of pure potash (K_2O), indicating that the output for the entire year may reach 50,000 to 60,000 tons. As only 32,573 tons was produced in 1917 the production is evidently increasing rapidly. The domestic production now equals 20 to 25 per cent of the normal domestic consumption before the war, which is estimated to have been about 240,000 tons. The statistics for the first half of the year are not complete, for returns have not yet been received from a few large producers, and it is possible that the production in 1918 may exceed 60,000 tons, for reports made to the Survey indicate that a number of new enterprises have been put into operation.

Reconstruction Conference at Atlantic City in December

Group Meetings Will Consider Problems of Each Industry

WASHINGTON—Preliminary plans for the War Emergency and Reconstruction Conference of War Service Committees to be held at Atlantic City, Dec. 4, 5 and 6, are announced by the Chamber of Commerce of the United States.

Reconstruction will be given a prominent place on the program, as it is recognized this subject must be taken up by business men to the end that there may be placed at the command of the Government all available sources of information. The work of reconstruction suggests the creation of a federation of all war service committees that whatever study and planning is carried on may be on behalf of all business. War industries and non-war industries are concerned equally in the determination of reconstruction problems. All European countries already are under way with reconstruction plans.

The Atlantic City conference, a call for which was sent out last week by the War Service Executive Committee of the Chamber of Commerce of the United States, will include four general sessions and numerous group and committee meetings. Into the final session will be brought for final action all the proceedings of the meetings.

There will be four general sessions participated in by all the delegates. On Dec. 4 there will be both morning and afternoon sessions and on the 5th and 6th morning sessions. The Chamber is engaged now in obtaining the best speakers available to discuss among others the following suggestions: reconstruction, industrial relations; raw materials and their control; price control; economic legislation affecting combinations; export and import operations; finance, etc.

The conference will be divided into groups at three sessions, the first to be held on the evening of Dec. 4, the second on the afternoon of Dec. 5, and the third on the evening of the same day. On the evening of Dec. 4 each war service committee will meet with its chairman to consider the problems of reconstruction as they affect that particular industry as well as to take up other problems which the war has demonstrated are vital to industry. On the afternoon of Dec. 5 the war service committees will meet in groups which are related as to their use of basic materials and as to their distribution problems, etc. With these groups will meet the commodity or section chiefs of the War Industries Board. Related groups will form themselves into ten major groups on the evening of Dec. 5 to take up the question of raw materials, price control and subjects arising from related group meetings. After the general meetings of the committees of the related groups and of the major groups it is hoped there will be presented definite recommendations covering the reconstruction period, with the possibility of creating an executive committee empowered to gather data and to function with industries to meet the many problems that the nation's industries will be called upon to solve with the end of the war.

All the industries represented will segregate into 35 related groups, of which sand, lime, stone and cement, are one. In the 10 major groups these industries come in under Earthen Products.

A questionnaire of 25 headings has been sent to all the war service committees for the tabulation of the probable labor requirement for 1919 and for suggestions for Government supervision during the reconstruction period.

The big road congress at Chicago scheduled for the same time has been postponed to Dec. 11 and 12.

Building Projects Released Amounting to $20,000,000

B. M. BARUCH, chairman of the War Industries Board, authorizes the following:

Deferred building projects amounting to more than $20,000,000 were released immediately, Nov. 12, according to the statement of D. R. McLennan, chief, nonwar construction section of the War Industries Board. This action followed promptly the modification on Monday by the War Industries Board of restrictions on nonwar construction which had been made necessary by the material and labor requirements of the war program.

Particular effort was made to give release as quickly and as widely as possible to building operations that had been restricted.

The projects for which releases were issued Nov. 12 comprise a very large number of buildings of comparatively small size.

This means a wide distribution of work all over the country from coast to coast. The action will be beneficial particularly therefore to the small-building contractors.

Included among the projects released for construction are large numbers of dwellings, farm buildings, small school houses, irrigation enterprises, municipal improvements, and buildings for the production and storage of food supply.

Transition of Industries from War to Peace Basis to Be Gradual

War Industries Board to Continue Its Functions as Heretofore Until Peace Treaty Is Signed

B. M. BARUCH, chairman of the War Industries Board, authorizes the following:

For some time to come, assuming the armstice will be signed, for a period to be determined by the war-making agencies of the Government, Government contracts must continue on a wide scale. This circumstance applies to a considerable share of present contracts.

As the demand for raw materials is lessened by the reduction of war requirements and the cancellation of war contracts, if and when such cancellations be made, the raw materials so made available will be released and allocated by the War Industries Board, for use in supplying civilian and export demands, which through curtailment have been held in check during the war. In addition to the ordinary commercial requirements there will be a heavy flow of materials thus released to supply the demand for the great reconstructional work required by the war-devastated European countries.

Gradual Lifting of Embargo

At the same time there is to be a gradual lifting of the restrictions and curtailments that have been imposed upon industry by the exigency of the war so as to allow as promptly as possible free flow of all supplies into peace channels.

The War Industries Board will continue to exercise its functions until the peace treaty is signed, to the end that the readjustment of the matters on which it has been acting may be made in as orderly a manner as possible.

A committee named by the President has been and is now at work to devise the best mechanism of bringing about the adjustment from a war to a peace basis. The report of this commission may take the form of suggested legislation.

The whole effect of the readjustment plans will be to the end of bringing about necessary changes with as little dislocation as possible and the full opportunity for all to benefit as in the past by individual ingenuity, vision and fair dealing.

NEW MACHINERY AND EQUIPMENT

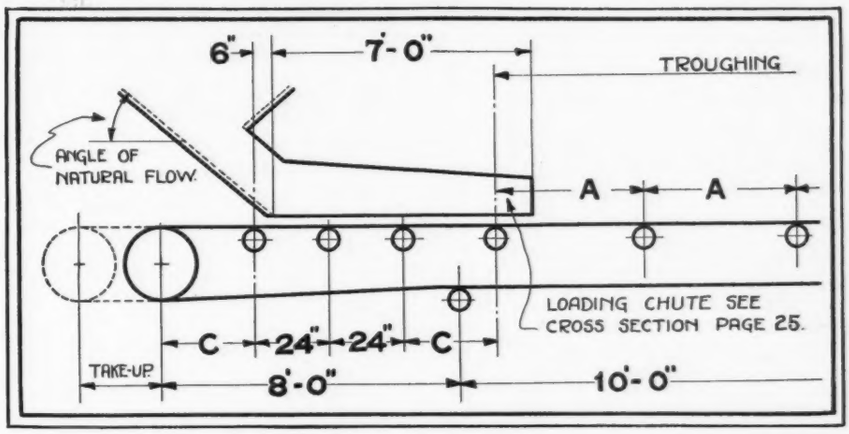
Belt Conveyors

THE Jeffrey Mfg. Co., Columbus, Ohio, has published an 80-page booklet on belt conveyors, which contains a wealth of valuable information for all producers in the rock products industries, as the following extracts will prove:

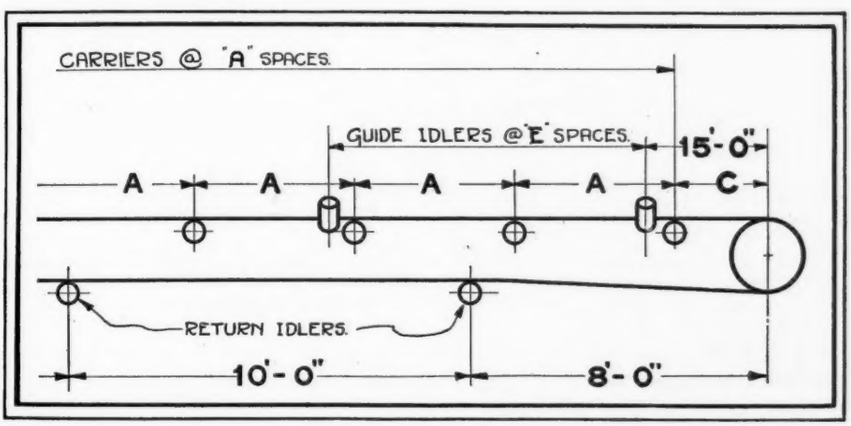
Data for Making Conveyor Installations

WIDTH OF BELTS: For loose materials use at least 4 times the uniform size of material handled plus 6 in. or 4 times the average sized pieces plus 6 in. where such pieces are about 70 per cent to 80 per cent of the whole—with the width of the belt in no case to be less than twice the largest pieces to be handled plus 8 in., where such pieces do not exceed 10 per cent in uniform distribution of all the material carried.

CAPACITY IN TONS PER HOUR of materials weighing 50 lbs. per cu. ft. and carried over three or five pulley troughing



carriers is approximately 8 per cent of the square of the number of inches in the width of the belt, for each 100 ft. of belt speed per minute.



MAXIMUM SPEEDS OF BELTS for loose materials equal approximately an initial speed of 250 ft. per minute for a 10-in. belt, plus 10 ft. per minute for each additional inch of belt width. Slow speed 150 ft. per minute. Speeds of package conveyors 75 to 125 ft. per minute; of picking or sorting belts 40 to 50 ft. per minute.

MAXIMUM INCLINES: Belts are ordinarily installed to carry horizontally although most material readily may be carried in a troughed belt at 18°—20° to the horizontal, many others as high as 21°—23° and some few at 25°. Recommendations covering angles over 20° will be made upon statement of material to be handled, moisture in same, and nature of installation.

HORSEPOWER REQUIRED: Approximately 2 per cent of the number of tons per hour carried for each 100 ft. of horizontal belt length and 1 per cent additional for each 10 ft. rise of incline. Increase this horsepower at the belt 5 per cent for each driving reduction through chain, belting or cut gears and 10 per cent for each reduction through rough gears to obtain the final horsepower at line shaft, motor or engine.

BELT VALUES: Proper flexibility in belts for troughing carriers is one ply for each 4 to 5 in. of belt width, with 12 in., 3-ply as a minimum and 48 in., 8-ply as a maximum in ordinary service.

ULTIMATE STRENGTH of the average rubber belt is 360 lbs. per inch width of each ply, with a safe working tension of 30 lbs. per each inch width of each ply. Factor of safety 12. The pull required to move a belt over its carriers upon the level is approximately 20 per cent of weight of belt plus 10 per cent of weight of load upon the belt.

TERMINAL PULLEYS: The diameter of drive pulleys in ordinary good practice is 5 times the number of belt plies with the diameter of all other pulleys taking 180 degrees wrap 4 times the number of plies.

CLEANING BRUSHES: Cleaning brush speeds are ordinarily 800 to 1,000 ft. per minute at the surface for dry dusty materials; 1,000 to 1,200 for damp materials; 1,200 to 1,500 for wet, sticky materials.

Spacing of Troughing Carriers and Guide Idlers

Width of Belt Inches	A—For Materials		Sorting Belts only	C	E
	Not over 100 lbs. Cu. Ft.	Over 100 lbs. Cu. Ft.			
14–16	5′–0″	4′–6″	.....	2′–6″	30′–0″
18–20	4′–6″	4′–0″	.....	3′–0″	45′–0″
24–30	4′–0″	3′–6″	3′–6″	3′–0″	45′–0″
36–42	3′–6″	3′–0″	3′–0″	3′–0″	45′–0″
48	3′–6″	3′–0″	2′–6″	3′–0″	.....

The Rock Products Market

Agricultural Limestone Wholesale at Plant, per Ton

EASTERN:

Coldwater, near Rochester, N. Y.—(80% thru 100 mesh) Analysis, $CaCo_3$, 56.77%; $MgCo_3$, 41.74%.... 2.25@2.65

Danbury, Conn.—(50% thru 100) Analysis, $CaCo_3$, 96%; $MgCo_3$, 2%; ppr., $4.00; bulk..... 2.75

Hillsville, Pa.—(90% thru 100 mesh) in 80 lb. ppr. bags, $4.50; bulk..... 3.00

Jamestown, N. Y.—(90% thru 100 mesh)—Bags 2.50

Pownal, Vt. (50% thru 100) Analysis, $CaCo_3$, 96%; $MgCo_3$, 2%; ppr., $4.00; bulk 2.75

Walford, Pa.—(70% thru 100 mesh; 90% thru 50 mesh; 50% thru 50 mesh; 100% thru 10 mesh; 50% thru 4 mesh), paper sacked..... 5.00
Bulk 3.00

West Stockbridge, Mass. — (50% thru 100) Analysis, $CaCo_3$, 96%; $MgCo_3$, 2%; ppr., $4.00; bulk..... 2.75

CENTRAL:

Alton, Ill.—(Pulv. and 90% thru 50 mesh; 90% thru 4 mesh) Analysis, $CaCo_3$, 96%; $MgCo_3$, 75%..... 2.00

Bedford, Ind.—(90% thru 10 mesh) Analysis, $CaCo_3$, 98.5%; $MgCo_3$, 0.5% 1.75

Columbia, Ill., near East St. Louis —(⅛" down) ..... 1.25@1.80

Elmhurst, Ill. — Analysis, $CaCo_3$, 29.43%; $MgCo_3$, 20.69%..... 1.00

Greencastle, Ind. — (50% thru 50 mesh) Analysis $CaCo_3$, 98%..... 1.75

Lannon, Wis.—(50% thru 50 mesh) Analysis, 53.35%, $CaCo_3$; 43.27% $MgCo_3$ 2.00

Marble Cliff, O.—(50% thru 100 mesh) Analysis, $CaCo_3$, 86%; $MgCo_3$, 8%..... 3.00

Marblehead, O.—(50% thru 100 mesh; 60% thru 50 mesh; 100% thru 10 mesh)—Analysis (Min.), $CaCo_3$, 32.03%; $MgCo_3$ 3.75%. Bulk, $3.00; ppr. 80 lb. sack..... 4.50

McCook, Ill.—(90% thru 4 mesh)... .75@1.00

McCook, Ill.—(100% thru ¼" sieve; 78:12% thru No. 10; 53:29% thru No. 20; 38:14% thru No. 30; 26:04% thru No. 50; 16:27% thru No. 100) Analysis, $CaCo_3$, 54.10%; $MgCo_3$, 45.04%..... 1.00@1.25

Montrose, Ia.—(90% thru 100 mesh) 1.25@1.50

Muskegon, Mich.—(50% thru 50 mesh) Analysis, $CaCo_3$, 53.35%; $MgCo_3$, 43.27%..... 1.50@2.00

North Industry, O.—(50% thru 100 mesh; and pulverized limestone) Analysis, $CaCo_3$, 91%; $MgCo_3$, 1.63% 3.00

Piqua, O.—(50% thru 100 mesh).... 2.50@4.00

Rockford, Ill.—Analysis, $CaCo_3$, 53.75%; $MgCo_3$, 44.35%..... 1.25

Stolle, Ill. (near East St. Louis on I. C. R. R.)—(Thru ⅛" mesh) Analysis, $CaCo_3$, 89.61 to 89.91%; $MgCo_3$, 3.82%..... 1.50

Stone City, Ia.—(50% thru 100 mesh) .50

Whitehill, Ill.—(50% thru 50 mesh), Analysis, $CaCo_3$; 96.12%; $MgCo_3$, 2.50% ..... 1.25@1.50

SOUTHERN:

Brooksville, Fla.—Pulverized limestone 1.80

Cartersville, Ga.—(50% thru 100 mesh) Analysis, combined carbonates, 96%..... 3.50

Fletcher, N. C.—(100% thru 10 mesh) Analysis, $CaCo_3$, 90%; $MgCo_3$, 80%. Paper, $3.75; bulk.. 2.25

Irvington, Ky.—(50% thru 4 mesh). 1.90

Keystone, Ala.—(90% thru 50 mesh) Analysis, $CaCo_3$, 99.50%; $MgCo_3$, none 1.25

(Continued on next page.)

Wholesale Prices of Crushed Stone

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:						
Buffalo, N. Y.	1.00, all sizes from bins.			1.25, all sizes from stock piles.		
Burlington, Vt.	.....	.....	2.50	2.00	1.75	.....
Coldwater, nr. Rochester, N. Y.			Flux, 1.50@2.10			
Grove, Md.	.....	.....	2.25	2.05	1.65	1.50
Hagerstown, Md.			$2.00 for all sizes			
North Leroy and Akron, N. Y.			$1.00 for all sizes, including R. R. ballast			
Quarryville, Pa.	.....	.....	.....	2.00	(local trade only)	
Rock Cut, N. Y.	.80	1.20	1.20	1.20	1.20	1.20
Walford, Pa.	1.25	1.50	1.50	1.50	1.50	1.50
CENTRAL:						
Alden, Ia.	.20	.....	1.00	1.00	.....	.....
Alton, Ill.	1.85	.....	1.45	1.35	.....	.....
Belvidere, Ill.			1.00 for all sizes			
Cleveland, Ohio			Various sizes $1.90 per net ton			
Columbia, Ill. (near E. St. L.)	1.25@1.80	.85@1.20	.95@1.30	.95@1.30	.80@1.20	.....
Detroit, Mich.			Various sizes $1.50 per net ton			
Dundas, Ont.	.65	1.10	1.10	1.10	.90	.90
Eden and Knowles, Wis.	.80	.80	1.00	1.00	1.00	1.00
Elmhurst, Ill.	1.00	1.00	1.00	1.00	1.00	.90@1.00
Ft. Wayne, Ind.			Various sizes $1.60 per net ton			
Hull, Canada	1.20	1.20	1.20	1.05	.80	.....
Greencastle, Ind.	1.00@1.25	1.10	1.00	.90@ .95	.90	.90
Illinois, Southern	1.50	1.25	1.25	1.25	1.25	1.10
Lannon, Wis.			1.00 all sizes			
Lima, Ohio	1.00		1.10 for all other sizes			
Linwood, Scott Co., Ia.	.50	.....	1.13	1.05	1.13	.....
Mankato, Minn.	.....	.....	.....	1.25	1.00	.....
Mayville, Wis.	.70@ .75	.70@ .75	1.10	1.10	1.10	1.10
McCook, Ill.	$1.00@1.25	1.50@1.65	90@1.10	70@ .90	70@ .85	70@ .85
Oshkosh, Wis.			1.00 in all sizes, Blue Limestone			
Ottawa, Can.	1.90	2.00	2.00	1.75	1.50	.....
River Rouge, Mich.	.60@1.00	.95@1.00	.95@1.00	.95@1.00	.95@1.00	.95@1.00
Rockford, Ill.	1.25	.....	.....	1.25	1.25	1.25
Saginaw, Mich.	.95	.95	.95	1.05	.95	.95
Sheboygan, Wis.			80@1.00 for all sizes			
Stone City, Ia.	.50		(1-inch 1.20)	1.10	1.00	.....
SOUTHERN:						
Brookville, Fla.	.....	.....	.....	2.50	.....	.....
Fort Springs, W. Va.	.50	1.60	1.60	1.40	1.30	1.10
			Railway ballast 1.10 per cu. yd.			
Irvington, Ky.	.75	.....	.....	.90	.90	.....
Ladds, Ga.	.....	2.40	2.30	2.20	2.10	.....
Mascot, Tenn.	.....	.75	.....	.....	.....	.....
Stephensburg, Ky.			1.20 any size			
Winnfield, La.	1.20	1.80	1.80	1.80	1.80	1.80
WESTERN:						
Atchison, Kans.	.25	1.30	1.30	1.30	1.20	1.20
			Rip-Rap @ 1.00			
Blue Sprgs. & Wymore, Neb.			(Florence flint imbedded in limestone)			
	.15	1.35	1.35	1.25	1.15	1.10
Carthage, Mo.	1.50	1.50	1.25	1.25	1.25	1.25
El Paso, Tex.			.90 for all sizes			
Kansas City, Mo.	.60	1.35	1.35	1.35	1.35	1.35

Crushed Trap Rock

City or shipping point	Screenings, ¾ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Baltimore, Md. (vicinity)—	1.25	3.15	2.75	2.50	2.40	.....
Birdsboro, Pa.	1.25	1.75	1.50	1.25	1.25	1.25
Branford, Conn.—Trap	1.00	1.40	1.40	1.35	1.25	.....
Duluth, Minn.—Trap	.65@ .75	1.35@1.50	1.25@1.35	1.15@1.25	1.15@1.25	.....
Farmington, Conn.	.70	.85	.85	.80	.....	.....
Glen Mills and Rock Hill, Pa. —Trap	1.10	1.40	1.80	1.60	1.60	1.40
			R. R. ballast 1.40			
Little Rock, Ark.—Trap	.....	1.75	.....	1.75	1.50	1.35a
Millington, N. J.	1.75	1.85	1.75	1.75	1.60	.....
Montrose, Ia.—Trap	.....	1.10@1.20	1.10@1.25	1.05@1.10	1.00@1.10	.....
Morristown, N. J.—Trap	1.85	1.75	1.75	1.60	1.40	1.40
New Britain, Conn.	.75	1.30	1.25	1.20	1.10	.....
North Branford, Conn.—Trap.	.80	1.30	1.25	1.20	1.10	.....
Richmond, Cal.—Trap	.....	.....	1.75	1.65	1.65	.....
Stephensburg, Ky.			1.26 per cu. yd. for any size produced			
Westfield, Mass.—Trap	.60	1.00	1.10	1.00	.90	.....

Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Brooksville, Fla.—Flint	1.00	.....	.....	2.25	.....	.....
Fair Oaks, Calif.—Cr. Bldrs.	.85	1.05	.95	.85	.85	.....
Hendlers, Pa.—Quartzite	.75	1.00	1.35	1.25	1.00	1.00‖
Little Falls, N. Y.—Syenite	.60		Other sizes 1.00, including R. R. ballast			
Richmond, Va.—Granite	1.25	1.50	1.50	1.50	1.50	1.50
Stephensburg, Ky.	1.26 per cu. yd. any size Basalt and other kinds					
Stockbridge, Ga.—Granite	.50	2.50	2.50	2.25	2.25	2.00

*Cubic yard. †Agri. lime. ‖R. R. ballast. §Flux. ‡Rip-rap. a 3-inch and less.

Agricultural Limestone Wholesale at Plant per Ton

(Continued from preceding page.)

Mascot, Tenn.—(90% thru 50 mesh) Analysis, $CaCo_3$, 52%; $MgCo_3$, 38% 1.50@2.00
Stephensburg, Ky.—Analysis, $CaCo_3$, 98% 1.20
Winnfield, La.—(50% thru 50 mesh) 3.00

WESTERN

Cement, Cal.—(50% thru 100 mesh) 4.00
Elsberry, Mo.—(Pulverized) Analysis,, $CaCo_3$, 99.29% ..... 1.85@1.95
Fresno, Cal.—(All thru 40 mesh) Analysis, $CaCo_3$, 98%; $MgCo_3$, 1%. (50% and 40% thru 200 mesh) sacked, $5.50; bulk, $5.00. (100% thru 40 mesh) sacked, $5.25; bulk 4.75
Bulk 1.50
Kansas City, Mo.—(50% thru 100 mesh) 1.50

Current Wholesale Prices in New York

CURRENT wholesale prices, prevailing on the Building Material Exchange and elsewhere in the Metropolitan district in New York, are given as below in the Record and Guide. Allowances must be made for yard and store prices:

Cement (wholesale, 1,000 bbls. lots and over, alongside dock, N. Y.):

Domestic Portland, Spot.....3.20@——
Rebate on bags, returned, 25c bag.
Rosendale Natural to dealers, wood or duck bags.....——@——
Rebate on bags, returned, 10c bag.

Gravel (500 cu. yd. lots f. o. b. alongside dock N. Y., wholesale):

1½ in. (nominal).....$2.00@——
Other sizes, no quotations.

Sand—

Screened and washed Cow Bay. 500 cu. yds. lots, wholesale..$1.25@——

(Continued on page 44.)

Miscellaneous Sands per Ton at Plant

GLASS SAND:

Bowmanstown, Pa.—Glass sand... 2.00@2.50
Cedarville, N. J.—Glass..... 1.50@4.00
Hellam, Pa.—Glass..... 2.00
Dundee, Ohio—Glass..... 2.00@2.25
Kermit, Va.—Glass sand:
Washed ..... 2.25@2.75
Crushed ..... 1.75@2.00
No. 2..... 1.00@1.25
Mapleton, Pa.—Glass, damp..... 3.00
Glass, dry..... 3.50
Massillon, Ohio—Glass..... 2.00
Michigan City, Ind.—Glass sand.... .40
Mineral Ridge, O.—Glass..... 1.75@2.75
Montreal, Can.—Glass..... 4.50
Montoursville, Pa.—Glass..... 1.25@2.00
Ottawa, Ill.—Crystal Silica..... 2.50
Sands, Elk Co., Pa.—Glass sand:
Washed, wet..... 2.50
Selected, green..... 2.50
St. Mary's, Pa.—Glass sand—Green, $2.50; washed 3.00
South Vineland and Cedarville, N. J.—Glass 2.00
Sugar Grove, Ohio—Glass..... 2.00@2.25
Thayer, W. Va.—Glass..... 2.75@3.25

FOUNDRY SAND:

Albany, N. Y.—Moulding..... 1.50@2.00
Allentown, Pa.—Moulding..... 1.40@1.50
Bowmanstown, Pa.—Moulding 1.50
Cleveland, O.—Moulding..... 1.25@1.75
Cleveland, O.—Core, at pit..... .33@ .75
Mapleton, Pa.—Molding, damp..... 3.00
Molding, dry..... 3.50
Michigan City, Ind.—Core..... .30
New Lexington, Stamden and Layland, Ohio—Moulding..... 2.00@2.25
West Albany, N. Y.—Molding..... 2.25@5.00
Zanesville, O.—Moulding..... 2.00@2.25

Wholesale Prices of Sand and Gravel

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine sand, 1/10 inch down	Sand, ¼ inch and less	Gravel, ½ inch and less	Gravel, 1 inch and less	Gravel, 1½ inch and less	Gravel, 2 inch and less
EASTERN:						
Bowmanstown, Pa.	.....	1.20	1.10	.....	.....	.....
Buffalo, N. Y.	1.25 cu. yd., all sizes					
Buffalo, N. Y. (Niagara River)	1.00	.85	.80	.80	.80	.80
Libby's Pit, Leeds Junct, Me.	1.00	.50@ .60	1.50	.....	1.35	1.25
Morristown, N. J.	.....	.50@ .55	.95@1.00	.95@1.00	.95@1.00	.....
No. Wilbraham, Mass.	.....	.50*	1.75*	.....	1.20*	1.05*
Washington, D. C.	.75	.75	2.00	1.70	1.40	1.20
CENTRAL:						
Algonquin, Ill.	All grades .50 per cu. yd. (3,000 lbs.)					
Barton, Wis.	.75	.70	1.00	.70	.70	.70
Bay City-Saginaw, Mich. (On cars)	1.00	1.00	1.95	1.70	1.70	1.50
Beloit, Wis.	.40	.40	.50	.40	.40	.40
Chicago, Ill.	.....	.95@1.05	.....	.....	.95@1.05	.....
Cincinnati, Ohio	.40@ .50	.40@ .50	.40@ .50	.50@ .60	.50@ .60	.50@ .60
Columbus, O.	.....	.60	.50	.60	.60	.60
Des Moines, Ia.	40@ .75	.50	1.25@1.50	1.25@1.50	1.00@1.25	1.00@1.25
Des Moines, Ia.	.30@ .40	.30@ .40	.....	.....	1.00@1.25	1.00@1.25
Elgin, Ill.	.....	.50	.50	.50	50	.50
Escanaba, Mich.	.85	.85	1.20	1.20	.85	.85
Fort Dodge, Ia.	1.00	.90	1.50	.....	1.50	1.50
Hawarden, Ia.	.40@ .60	.40@ .60	.....	.95@1.25	.....	.85@1.00
Greenville and Mechanicsburg, O.	.50	.50	.60	.60	.60	.60
Illinois, Northern	.60@ .70	.60@ .70	.70@ .80	.60@ .70	.60@ .70	.50@ .60
Indianapolis, Ind.	.50	.50	.....	.65	.65	.65
Janesville, Wis.	.....	.50@ .75	.....	.....	.50@ .75	.....
Kalamazoo, Mich.	.50@ 60	.50@ 60	.50@ .70	.60@ .80	.60@ .80	.60@ .80
Keithsburg, Ill.	.....	.60@ .70	.....	.65@ .80	.....	.....
Mason City, Ia.	.60	.50	1.10@1.20	1.20	1.00@1.20	1.00@1.20
	Railway ballast and road work, .40					
Milford, Ind.	.....	.60	.....	.....	.70	.....
Milwaukee, Wis.	1.06 for all sizes					
Minneapolis, Minn.	.50* 2800 lbs.	.50* 2800 lbs.	1.25* 2600 lbs.	1.20* 2600 lbs.	1.15* 2600 lbs.	1.10* 2600 lbs.
Montezuma, Covington, Ind.	.75	.75	.75@ .85	.75	.75	.75
Niles, Mich.	.....	.50@ .80	.60@ .85	.50@ .80	.50@ .80	.50@ .80
Sabula, Ia.	.40@ .60	.40@ .60	1.00	1.00	1.00	1.00
St. Paul, Minn.	.65*	.65*	1.75*	1.25	1.15*	1.15*
Terre Haute, Ind.	.75	.75	.75@ .85	.75	.75	.75
Wabash Valley District, Ind.	All sizes, .75.					
Winona, Minn.	.60@ .90	.60@ .90	1.00@1.40	1.00@1.40	.95@1.25	.95@1.25
Winona Lake, Ind.	.....	.85	.....	.....	.....	.....
SOUTHERN:						
Charleston, W. Va. (River)	1.20	1.20	1.30	1.30	1.30	1.30
Lake Weir, Fla.	.....	.50	.....	.....	.....	.....
Knoxville, Tenn.	.85@ .90	.85@ .90	1.00@1.50	1.00@1.50	.95@1.40	.95@1.40
New Orleans, La.	1.70*	(2500 lbs.)	2.50*	(2700 lbs.)	.....	.....
Pelzer, S. C.	All sizes, .55 per net ton					
Valde Rouge, La.	.....	.75*@1.00*	2.10*	2.00*	1.50*	1.25*
Waco, Tex.	.75	.75	1.20	1.20	1.00	1.00
WESTERN:						
Joplin, Mo.	1.00	.60	.45	1.50	1.25	2.00
Kansas City, Mo.	Car lots, building sand, @ .60; retail truck 1.50*					
Lincoln, Neb.—(Pit)	.55	.55	1.50	1.50	1.50	1.40
Pueblo, Colo.	.80	.60	.....	.....	1.50	.....
Roche Spur, Tulare Co., Cal.	.3⅝ River sand ¼ inch					
San Francisco, Cal.	1.15 for all grades					
Seattle, Wash.	.....	1.00*	1.75*	1.00*	1.00*	1.00*
Vancouver, B. C. (Scows)	.....	1.45*	1.70*	1.65*	1.65*	1.45*

Bank Run Sand and Gravel

City or shipping point	Fine sand, 1/10 inch down	Sand, ¼ inch and less	Gravel, ½ inch and less	Gravel, 1 inch and less	Gravel 1½ inch and less	Gravel, 2 inch and less
EASTERN:						
Attica, N. Y.	.50	.50	.60	.60	.60	.60
Burnside, Sand Pit, Conn.	All sand, .80 cu. yd.					
Bushnell's Basin, N. Y. (near Rochester)	All sizes, .40@ .50					
Forestport, N. Y.	1.00	1.00	.....	.....	.....	.....
Lowell Junction, Mass.	.....	.50*@ .75*	.....	.....	.....	1.25*
Pittsford, N. Y.	.....	.50	.....	.....	.....	.....
Yardville, N. J.	.....	.50 @ .75	.....	.....	.....	.....
York, Pa.	.....	1.00@1.25	(crushed rock)		.....	.....
CENTRAL:						
Attica, Ind.	.75					
Bay City-Saginaw, Mich. (On cars)	1.00	1.00	1.20	1.20	1.20	1.20
Cleveland O.	1.00@1.75 bank sand					
Des Moines, Ia.	Concrete mix washed at .60 per ton					
Escanaba, Mich.	.....	.50*	.....	.....	.....	1.00
Indianapolis, Ind.	Concrete mix .55					
Janesville, Wis.	.....	.....	.....	.....	.50@ .75	.....
Keithsburg, Ill.	.....	.40@ .60	.....	.....	.....	.....
Milford, Ind.	.....	.....	.....	.....	.50	.....
Montezuma, Covington, Ind.	.....	.....	.....	.....	.60	.60
Portsmouth, Ohio	.....	.65	.....	.85	.....	.....
Sabula, Ia.	.....	.....	.....	.....	.....	.50@ .70
Saginaw, Mich. (on cars)	1.20	1.20	1.80	1.80	1.80	1.80
Terre Haute, Montezuma, Ind.	.60 unscreened					
Toledo, O.	.....	.....	.....	.....	.....	.55@1.00
Wabash Valley District, Ind.	.75 for all sizes					
Winona, Minn.	Pit run gravel under 2-in., .60@.90					
SOUTHERN:						
Howcott, La.	50% and up in rock content over ¼" screen, .65					
Joplin, Mo.	.75	.60	.40	.....	.....	.....
Knoxville, Tenn.	.85@ .90	.....	.....	.....	.....	.....
Lindsay, Tex.	.....	.....	.44	.44	.....	.....
Valde Rouge, La.	Gravel 60% metal on ¼" screen, .60 per ton					
WESTERN:						
Pueblo, Colo.	River Run .60 unscreened					
Vancouver, B. C.	.....	.85@1.10	.....	1.00@1.25	.....	.85@1.00

* Cubic yard. B Bank. L Lake. ‖ Ballast.

Current Wholesale Prices in New York

(Continued from page 43.)

Lime (standard 300-lb. bbls.):

Eastern common, wholesale price .....$2.50@——
Eastern finishing, wholesale price .....$2.70@——
Hydrated common (per ton)..15.20@——
Hydrated finishing (per ton)..17.20@——

Plaster—(Basic prices to dealers at yard, Manhattan):

Mason's finishing in 100 lbs. bags, per ton.....$23.00@——
Dry Mortar, in bags, returnable at 30c each per ton.... 14.05@——
Block, 2 in. (solid), per sq. ft.....$0.11
Block, 3 in. (hollow), per sq. ft.... 0.11

Crushed Stone (500 cu. yd. lots, f. o. b. alongside dock N. Y., wholesale):

Trap rock, 1½ in. (nominal)...$1.85@——
Trap rock, ¾ in. (nominal)... 2.00@——
Crushed limestone, 1½ in..... 1.80@ 1.85
Crushed limestone, ¾ in..... 1.90@ 2.00

Building Stone—

Indiana limestone, per cu. ft.....$1.28
Kentucky limestone, per cu. ft..... 1.50
Brier Hill sandstone, per cu. ft..... 1.50
Gray Canyon sandstone, per cu. ft... .95
Buff Wakeman, per cu. ft..... 1.50
Buff Mountain, per cu. ft..... 1.50
North River bluestone, per cu. ft..... 1.05
Seam face granite, per sq. ft..... 1.00
S. Dover marble (promiscuous mill blocks, per cu. ft..... 2.25
White Vermont marble (sawed), New York, per cu. ft..... 3.00

Post-War Building Will Resume Gradually

CONTRACTORS who are looking ahead to the future of the building industry after the war, should not give themselves up too entirely to the optimistic outlook generally forecasted. This does not imply that a building boom will not come after the termination of the war. It is distinctly evident that the present inactivity of the industry will be in measure reversed by the needs for building which will call for constructive activity at that time.

It has been often emphasized in these columns, says the Record and Guide, that the present restrictions on building are forcing back construction which may virtually be classified as necessary, that is, construction which is of a nature that will insure its being eventually carried through to completion, even if postponed by temporary exigencies.

The first impulse to renewed life in the industry will rather come from that element which is already desirous of building, but is at the present time held up through lack of needful facilities. Those who have prospered during the period of the war will be ready to build as soon as the war is over.

School building, municipal improvements and other construction of a public nature should also contribute largely and immediately to this volume of business. But the considerable quantity of construction which will necessarily be somewhat deferred, will constitute a most advantageous factor in the contractor's plan for the handling of his renewal business after the war.

The reason why this gradual rather than abrupt resumption will react to the benefit of the industry is chiefly to be found in the labor difficulties which will be encountered. At first thought it would seem that the ending of the war should solve this problem for which it has been so directly responsible, but it must be realized that the easing up of this situation must be a somewhat gradual process, and cannot be transferred immediately onto a wholly favorable basis.

Business Prospects Good in the South

MEMPHIS, Tenn.—In Memphis and the Mississippi Valley, there is now but one untoward element, the scarcity of labor. Cotton has not been moving much but available labor is divided among so many essentials, that no line can claim it all. Gravel pits, clay pits and quarries in the main are active. Traffic situation is better and most of these lines are operating freely. The gravel and cement concerns in Memphis report that they are furnishing considerable material for government uses, and boats and barges and yards here show a good activity.

What is said of Memphis is also true of Little Rock and Arkansas points. C. L. Thompson, of Little Rock, and his associate, Mr. England, agents for the state of Arkansas, have been in Washington City to ascertain just what buildings will be permitted.

Business is reassuring here. The Tennessee Credit Men's Association held the past week at Memphis heard favorable reports on business conditions and means for enlargement following the war. Memphis building outlook for the next six months is satisfactory. One of the largest structures apt to be started in this time is the City Auditorium for which $750,000 in bonds have been issued.

The Greenville Stone and Gravel Co. of Memphis, are active at their quarries.

The Missouri Portland Cement Co., Union and Planters Bank and Trust buildings report good November trade on sand, gravel and cement products.

The highway advocates the Bankhead routes, and some Southern highway agents have been in Memphis the last few days in going over proposed routes through the Mississippi Valley. In turn some Memphians have been at the National Metropolis in the same connection. Nineteen nineteen gives promise of being a very active year in road construction.

U. S. Issues Pamphlets to Gain Foreign Trade—Cement First

WITH THE PURPOSE of stimulating foreign trade, the Department of Commerce has issued the first of a series of Spanish-English pamphlets, defining with scientific accuracy certain generally accepted American industrial standards for construction materials. This is an entirely new method of government trade promotion.

The first pamphlet, issued under the auspices of the Bureau of Foreign and Domestic Commerce, is a bi-lingual text entitled "Standard Specifications and Tests for Portland Cement," and was prepared by the American Society for Testing Materials, in co-operation with the American Society of Civil Engineers, the Bureau of Standards, the Bureau of Foreign and Domestic Commerce and the Office of Public Roads.

While the publication of this series of standards is aimed to facilitate American trade with the Latin countries, it is not an attempt to force American standards upon these countries. The standards of the American Society for Testing Materials are already known and used there.

The decision to publish the standards in Spanish was reached as a result of numerous requests received from Latin countries for just this sort of information. Great care was taken to make the translations thoroughly idiomatic as well as technically correct. By responding to this existing demand for information, the Department of Commerce and the co-operating scientific societies expect to stimulate in a marked way certain lines of trade that have been hampered in the past by lack of data published in the native language.

Railroads Have Spent Only Half Improvement Funds

WASHINGTON—The railroads, up to October 1, had spent only $403,864,000 on their $1,000,000,000 improvement program, authorized by Director General McAdoo for the year 1918, according to a statement by Robert S. Lovett, director of the railroad administration's division of capital expenditures. Of this amount $173,716,000 was spent for additions and betterments, such as track improvements, machinery, buildings, wharves, and terminals; $216,186,000 for cars and locomotives, and only $13,961,000 for new tracks.

Passed By The Screens

Incorporations

American Potash Co., Coplay; $10,000; George A. Christ, Allentown, Pa.

Hopkins Fertilizer Co., New Albany, Ind., increased its capital stock from $150,000 to $250,000.

Carbon Products Corp., Boston, Mass.; $100,000. Directors: Roy A. Corey, president; Daniel B. Linn, Dorchester, treasurer, and G. C. French.

Watertown Concrete Stone Co., Boston, Mass.; $95,000. Directors: George E. Marvin, president; William J. Martin, 24 Milk Street, Boston, treasurer, and A. C. Gould.

The Atlantic Sand Co., Norfolk, Va., has been incorporated; capital, $10,000; to engage in the production of sand, etc. A. Brooke Taylor is president and Robert M. Darden is secretary.

Application has been made to the Governor of Pennsylvania by Harry Whyel, H. L. Robinson and A. D. Williams for a charter for a proposed corporation, Fayette Refractories Co. Object to mine, quarry and produce firestone and other minerals and materials for refractory purposes. Umbel, Robinson, McKean & Williams, of Uniontown, Pa., are solicitors.

The Betsey Mining Co., of Princeton, Ky., recently incorporated for developing and operating mineral properties, has built its plant seven miles north of Princeton. The machinery has been installed. The plant being two miles from the nearest railroad, motor trucks are used to transport product to cars. J. M. Phillips is president; G. J. Phillips is secretary.

The Commercial Chat Co., of Joplin, Mo., recently incorporated, had completed the installation of its machinery, except a hoisting engine and derrick, two weeks ago at its two plants, Black Cat Mine, Fall City, and Blackberry Mine, Smelter Hill. Shipping facilities at each plant are 15 carloads per day. J. C. Clader is vice-president; A. G. Taubert, general manager; M. H. Taubert, secretary. Offices are in the Bartlett Bldg., Joplin, Mo.

Cement

Fire, on Nov. 6, destroyed the mixing building at the plant of the German Rock Asphalt & Cement Co., Kensington Avenue and New York Central Railroad, with loss estimated at $4,000.

Announcement has recently been made by Power Administrator Butler, of Sacramento, Cal., that all power restrictions in force affecting cement plants, sand and gravel and crushed rock works, have been removed.

The Pennsylvania Cement Co., Bath, Pa., is building a number of all-concrete dwellings for its employees. The structures are double residences, with all modern improvements and finished in cypress wood, and are located in Penn Street.

W. I. Bennett, electrical superintendent of the Canada Cement Co., says that he expects the Port Colborne plant to be allotted a large block of power as soon as the new plant of the Hydro Electric is completed at Niagara Falls, making available an additional 50,000 h.p.

Personals

L. F. Rhodes, formerly publicity manager of the Canadian Cement Co., Ltd., Montreal, who left about six months ago to go with the Truscon Steel Co., Youngstown, Ohio, has been made manager of the Gulf Coast territory with headquarters at New Orleans.

T. Poole Maynard, Ph. D., geological and industrial engineer, of Atlanta, Ga., has been appointed Southern representative of the Research Corporation of New York. This corporation controls the rights in the Eastern States for the Cottrell process, other than that as applied to Portland cement by-products.

OBITUARY

Francis R. Crispen, secretary of the Traylor Engineering & Manufacturing Co., passed away Saturday, Oct. 26.

Charles R. Lavelle, secretary of the St. Marys Cement Co., St. Marys, Ont., died recently as the result of an attack of influenza. Mr. Lavelle was born at Durham, Ont., and was in his 38th year.

Potash

The Coplay Cement Co., at Coplay, Lehigh county, Pa., will manufacture potash for fertilizer as a by-product, says a news report.

Recent experiments carried on by the Dixie Engineering Co., of Hagerstown, Md., show that 76 per cent of the potash values can be recovered from the Georgia slates carrying 8 per cent potash, by the application of the Cottrell process, the autoclave and leaching.

Potash fields, said to promise good production, have been discovered at Hartsel, Col., by Mrs. E. R. Ashe, formerly of Kansas City, more recently of Denver, according to reports. Mrs. Ashe has leased a tract of 320 acres and will start operations on the fields as soon as machinery is installed.

That greasewood contains 50 per cent more potash than kelp is an announcement made from the laboratory of H. Anderson Smith at Phoenix, Ariz., says the Los Angeles Times. The greasewood plant above ground shows by incineration 7.3 per cent ash and this ash analyzes 19½ per cent potassium chloride. At this rate, 100 tons of greasewood would make 7.3 tons of ash and 100 tons of the ash would make approximately 20 tons of potassium chloride. It is believed, adds the Times, that the cost of harvesting and treating the greasewood will be about one-fourth that of handling kelp.

The potash excitement in Nebraska has apparently started many wildcat stock selling campaigns. The editor of the Harvard (Neb.) Courier writes: "So far, because a few men have made fortunes out of the potash business, the rule has been to play up every project that is mentioned, thus playing right into the hands of blue sky promoters. As a matter of fact, the supply of potash, like coal, oil and other deposits, is not unlimited and the cost of producing potash is greater than the retail price under normal conditions. This means that when the war is over and conditions return to normal that the industry will be short lived unless greatly reduced cost of production can be secured.

Gypsum Products

The American Gypsum Co., Port Clinton, Ohio, through their Pittsburgh representative, G. W. Richards, received another large order for plaster from the U. S. Government for the housing operation at Erie, Pa.

Directors of the United States Gypsum Co., in response to numerous inquiries, have decided to give the shareholders an official statement of the company's outlook. President Sewell L. Avery says: "The tonnage of the company for the first nine months of the year is approximately 75 per cent of that to be expected in normal times. As the government's income and excess profit tax laws are still undetermined, it is impossible to estimate what the deductions from the company's earnings will be. It is the impression of the management, however, the company should end the present year with a net return equal to the best showing heretofore made."

Sand and Gravel

The pit, plant, real and personal property, including machinery and equipment, of the Indiana Sand & Gravel Co. is being offered for sale at auction by the president, L. A. Hippach, 366 West Ohio St., Chicago. The pit and plant are located on the C. & E. I. railroad, four miles north of Attica, Ind. Written bids will be received up to 1 o'clock, Saturday, Dec. 14, when the property will be offered for sale. The land consists of 77 acres.

Quarries

The James H. Young Stone Co., New York, has sold its plant at 136th Street and the East River to the Milliken Brothers Mfg. Co., Inc., Woolworth Building, New York.

The Somerset Stone Crushing Co., of Bernardsville, N. J., announces that it has sold out its available product for this season and is now engaged in stripping for 1919 business.

The Baltes Co. big stone crushing plant and quarry near Montpelier, Ind., has been purchased by the France Stone Co., of Toledo, Ohio. The consideration was not named in the report.

In connection with its new ferro-manganese plant at Great Falls, Mont., the Anaconda Copper Co., New York, is using 70 pounds of limestone for each charge in the furnace. The charge also consists of 500 pounds of manganese, 20 pounds of iron ore, and about 170 pounds of coal. The plant, which has now been placed in operation, conscists of five furnaces, each furnace being 22x10x8 feet, inside dimensions.

The Florida Fertilizer Milling Co., Ocala, Fla., recently incorporated with a capital of $100,000, has perfected its organization and is planning for the immediate operation of a new plant, construction of which has been completed. The works are located at Dunnellon, Fla., and equipment has been installed, including four mills, two rotary driers, elevators and other apparatus, costing approximately $25,000. It is planned to have a daily capacity of approximately 200 tons of pulverized hard rock phosphate.

Retail Dealers

Fred Rheins Cement & Concrete Co., 325 19th Ave., Milwaukee, Wis., have dissolved. Capital stock was $1,000.

H. A. Fey has taken over the business of the Interior Marble Co., 446 East Water Street, Elmira, N. J. Mr. Fey has had 36 years' experience in the business.

Cook-Anderson Co., of Beaver, Pa., have announced the purchase of the interests of Brown Bros., coal dealers and dealers in sand, gravel and builders' supplies in Water Street, Rochester. The Rochester firm sold out its interest owing to the drafting of one member of the company.

Manufacturers

Crescent Belt Fastener Co., 381 Fourth Avenue, New York, have issued an argument on belt values in movie scenario style with illustrations. The story is told in 24 pages and is entitled "Come Again."

Acme Road Machinery Co., Frankfort, N. Y., introduces in its catalogue No. 9, the Solid Steel Frame Stone Crusher for which it claims it has done away with "two-fifths of the weight of the cast iron crusher frame, the lack of rigidity of the sheet steel held together by bolts, and has placed on the market a machine combining lightness with a maximum of strength and efficiency." Among other things entirely new, the company announces it has "produced and put into practical use a folding elevator and handy portable bins in capacity from 15 to 50 tons." The principal parts of the solid steel Frame Stone Crusher are made of open hearth steel casting, and the company maintains: "the substance has yet to be found that will break a lever, jaw, eccentric roll or frame" of the Acme crusher. Bulletin No. 104 is the latest supplement describing the Acme portable Gravel and Stone Screener. The catalogue gives minute descriptions of all road machinery made by the company.

Lime

County Farm Bureaus and agricultural advisors are advising farmers to lime their lands at once, this fall, and not to delay until spring.

USED EQUIPMENT

ADVERTISEMENTS in this department are for the Sale and Want of Second-Hand Machinery and Equipment.

RATES: $2.50 per column inch per insertion.

STEAM SHOVELS
LOCOMOTIVES
LOCOMOTIVE CRANES
CARS
RAILS
HOISTING ENGINES
GRAB BUCKETS
CRUSHERS
COMPRESSORS, ETC.

Try us for honest value in dependable "used" material of this character.
WE'LL TREAT YOU RIGHT.

Wm. B. Grimshaw Co.
1048 Drexel Building
PHILADELPHIA, PA.
Dealers in "Used" but "Not Abused" Machinery

FOR SALE

Complete Rock Crushing Outfit

1 9A Portable Galion Jaw Crusher, 10x20 Manganese Jaws, 2 sets.
1 22 ft. Steel Bucket and Frame Elevator.
1 30 ton Portable Bin, 3 compartments.
1 7x9 Practically new Galion Jaw Crusher, Manganese Jaws.
1 14 ft. Steel Bucket and Frame Elevator.
1 Vulcan Steam Shovel, Full Revolving, No. 1410 with ⅝ yd. Dipper.
1 40 H. P. Westinghouse Motor, A. C. 820 R.P.M., 3 Phase.
1 25 H. P. General Electric Motor, A. C. 1100 R.P.M., 3 Phase.
3 1 yd. Peteler Side Dump Cars, Steel Frame.
900 ft. 20 lb. Rail.
1 Double Hoisting Drum with 300 ft. ⅝ in. Plow Steel Cable.
1 Fuller & Johnson, 10 H. P. Gasoline Engine.

TOMAHAWK CRUSHED ROCK & GRAVEL CO.
TOMAHAWK, WISCONSIN

FOR SALE

At Bargain Price

1 Little Giant Steam Shovel,

mounted on traction wheels, equipped with 54"x8' 6" upright Boiler, 7"x11" main engine, 5x6 boom and swing engine, one yard rock dipper. Crane has 12 ft. lift. Machine runs on street or road.
Flat Wheels: 12¼" face. Gauge of wheels. 9' 2⅛"; inside to inside of wheels 8' 2⅛".
Back Wheels: 12" face. Gauge as above.
Diameter of Wheels: 3' 6½"; steers from the back.

COMMUNICATE
FIBORN LIMESTONE COMPANY
Sales Department
Sault Ste. Marie Ontario, Canada

FOR SALE

45—2 yd. end dump, Austin type cars, 3 ft. gauge, steel bodies. In good operating condition.
18—1 and 1¼ yd. Kopple type, double side steel dump cars, 24" gauge.
1—Davenport locomotive, 9x14, 3 ft. gauge—cheap.

PRINCE-JOHNSON LIMESTONE COMPANY
615 American Bank Bldg. Kansas City, Mo.

FOR SALE

1—Porter Locomotive, 9x16", in fair condition.
1—Marion Steam Shovel No. 373, complete with 2½ yard dipper and boom. All parts in excellent condition, new housing and roof.

The above machinery must be sold at once. If you are looking for a bargain, have this machinery inspected.

INDUSTRIAL SERVICE CO.
LINCOLN, N. J.

FOR SALE (Good as New)

1—Farrell 20 in. Crusher
1—80 Mesh 20 Ton Pulverizer
1—Double Roll Back Geared Pulverizer
Will be sold cheap if moved quickly.
For further particulars address
ORANGEVILLE AGRICULTURAL WORKS
Orangeville, Columbia County, Pa.

USED PLOW AND CRUCIBLE STEEL CABLE

Have sold four carloads this season and have on hand 40,000 feet in various sizes and lengths, 6x7 and 6x19 construction, all carefully selected, 90% efficiency.

Will ship subject to inspection

B. Carpenter, 118 N. La Salle St., Chicago

RAILS

All sections of new and second-hand, on hand for quick shipment. Also purchase old and abandoned plants for dismantling purposes.

M. K. FRANK, Pittsburgh, Pa.

FOR SALE

Used steam drill and six brand new End Dump Steel Quarry Cars, two yard capacity, equipped to handle from either end or side. Manufactured by Austin Manufacturing Co.

THE SHERMAN NURSERY COMPANY,
Charles City, Iowa.

GYRATORY CRUSHERS

1 Gates No. 12 3 Number 5 1 Kennedy 10
3 Kennedy 6 3 Austin No. 8 2 McCully 7½

Locomotives, Cars, Cranes, Steam Shovels

J. F. DONAHOO CO., Birmingham, Ala.

FIRST —Get Bulletin 250—or, wire
ZELNICKER IN ST. LOUIS
before buying or selling
RAILS
LOCOMOTIVES CARS CRANES
Shovels Machinery Piling, Etc.
What have you for sale?

WANTED

a set of 42 inch rolls for crushing rock

The WOODVILLE LIME PRODUCTS CO.
1341 Nicholas Bldg., Toledo, Ohio

RAILS - RAILS - RAILS

NEW RAILS
16-20-25-40-70-80
RELAYERS
30-35-56-60-65-85

MORRISON & RISMAN
RAIL DEPARTMENT: BUFFALO, N. Y.

ROCK PRODUCTS
Fills the Bill. Read It!
Advertise in It! It Pays!

You are reading this ad. So are others. That is why it will pay you to advertise your used machinery in these columns.

Saying "I saw it in ROCK PRODUCTS" will bring quick action.

CLASSIFIED ADVERTISING

ADVERTISEMENTS in this department are for Positions Wanted, Positions Vacant, Business Opportunities, Plants for Sale, etc.

RATES: 25c per line, per insertion; minimum charge, 50c. With display of any sort, $2.50 per column inch, per insertion.

Plants for Sale

Unusual Opportunity

Sale of Assets of

INDIANA SAND & GRAVEL CO.

Located on C. & E. I. R.R. four miles north of Attica, Ind.

On Saturday, December 14th, 1918, at 1 P. M., we will sell at public auction to the highest bidder for cash all of our property located as above, and consisting of about 77 acres of sand and gravel lands, buildings, machinery and equipment. Written bids may be filed in advance, accompanied by certified check of 25% of the bid, or bids may be made at the auction. Bids will be received and taken on separate parcels of machinery, equipment, real estate, etc., and also on the entire real and personal property offered as a whole, and we reserve the right prior to, and at, the auction to decide whether to accept bids for the property in parcels, or as a whole.

To those interested, further information will be given on application to the undersigned.

INDIANA SAND & GRAVEL CO.

Care L. A. HIPPACH, President

366-400 W. Ohio St., Chicago, Ill.

FOR SALE OR LEASE: Crushed stone quarry situated near Wilkes-Barre, Pa. Very hard green sandstone, practically equal to trap rock for road material. Quarry equipped to produce five to six hundred tons per day—has frequently run eight hundred. Ample rail facilities and an extensive market. For detailed information communicate with Arthur L. Stull, 182 S. Franklin St., Wilkes-Barre, Pa.

FOR SALE—Limestone crushing plant with 5 lime kilns. Forty acres stone land. Eastern part of Indiana. Details furnished. Address Box 1264, care ROCK PRODUCTS.

FOR SALE

CRUSHED STONE PLANT

in Central New York

Exceptional production facilities and quality of stone for fluxing and commercial purposes. Market for entire production. Labor and Material guaranteed. Address

Box 1278, care ROCK PRODUCTS

Positions Wanted

WANTED

Position as General Superintendent

of Lime plant or large rock quarry by man of 9 years' experience as General Superintendent of medium size lime plant and quarry. Speak Spanish fluently. I get results. Address Box 1280, care Rock Products.

Help Wanted

WANTED

Superintendent for Cement Plant. Located in Lehigh Valley; 2000 bbls. daily capacity. Must be available Jan. 1st or before. Write fully, giving experience, references, age and salary expected. Address Box 1281 care ROCK PRODUCTS.

WANTED—Driller to operate Cyclone well drill with gas engine power. Steady work, good accommodations and good pay. Quarry located seven miles southeast of East St. Louis. Address Stolle Quarry Co., East St. Louis, Ill.

WANTED—Purchasing Agent by large Cement Manufacturing Company. None but qualified, A-1 man who can and will make good need apply. Give references and state salary expected. Address Box 1279, care of ROCK PRODUCTS.

ALPENA HURON PORTLAND CEMENT COMPANY HURON MICH.

Daily Capacity 9,000 *Barrels*

MORE THAN FIFTEEN YEARS OF SATISFACTION

GREAT WATER AND RAIL FACILITIES BEST SERVE THE ENTIRE MIDDLE WEST

FIVE PLANTS: ALPENA, DETROIT, WYANDOTTE, CLEVELAND AND DULUTH

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EVERY BARREL TESTED AND GUARANTEED

SOLD BY THE BEST DEALERS USED BY THE BEST BUILDERS

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Quality, Quantity, Service

Best Bros. Keene's Cement

The Plaster That Stands Hard Knocks

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Urschel-Bates Valve Bag Co.

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Alexander Milburn Co., The

CALCINING MACHINERY
Atlas Car & Mfg. Co.
Butterworth & Lowe

CEMENT, PORTLAND
Carolina Portland Cement Co.
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CHAINS AND TRANSMITTING MACHINERY
Stephens-Adamson Mfg. Co.

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Jeffrey Mfg. Co., The
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Miscampbell, H.
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Watt Mining Car Wheel Co.

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Woodville Lime Products Co.

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LIME KILNS
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Stephens-Adamson Mfg. Co.
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Fate Co., J. D.
Jeffrey Mfg. Co., The

MORTAR COLORS
Chattanooga Paint Co.

MOTORS, ELECTRIC
Gifford-Wood Co.

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Portable Mach. Co.

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Weller Mfg. Co.

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Du Pont de Nemours Co., E. I.
Grasselli Powder Co.

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Locomotive Pulv. Fuel Co.

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The W. S. Tyler Co.

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Gifford-Wood Co.
Hendrick Mfg. Co.
Johnston & Chapman Co.
Stephens-Adamson Mfg. Co.
Sturtevant Mill Co.
The W. S. Tyler Co.

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Steam and Electric
Ball Engine Co.
The Osgood Co.

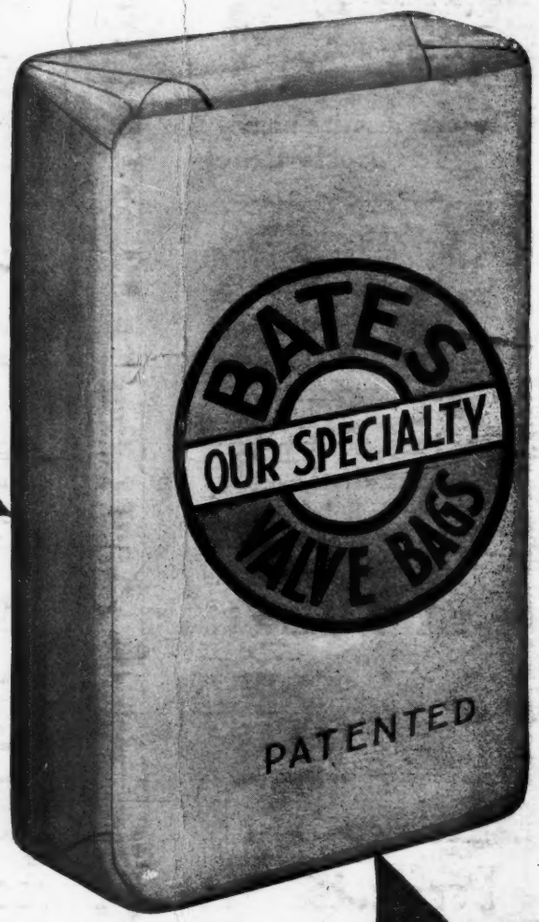
STEEL PROCESS
Stroh Steel Hardening Process Co.

TESTING SIEVES AND TESTING SIEVE SHAKERS
The W. S. Tyler Co.

WIRE ROPE
American Steel & Wire Co.
Leschen, A., & Sons Co.
Waterbury Co.

WIRE CLOTH
Audubon Wire Cloth Co.
The W. S. Tyler Co.

"Increasing the Production Was Harder Then Than Now—



—but there wasn't much use in speeding up when it was so difficult and so expensive to take care of the product.

—but now we can take care of the stuff as fast as we can produce it, thanks to the

BATES VALVE BAG

and the wonderful self-sealing, bag-filling system." This is a composite remark from hundreds of owners who grew up in the business and who now use the Bates Valve Bag.

If YOUR plant is a steady producer of lime or any other product that requires bagging in such a way that the contents will be intact when the destination is reached—if you want to economize on space for stacking—better learn about the Bates System.

URSCHEL BATES VALVE BAG CO.
TOLEDO, OHIO